

THE IRON AGE

THURSDAY, JUNE 6, 1889.

Elevators in the Eiffel Tower.

With Supplementary Page of Engravings.

Now that the Eiffel Tower, the greatest feature of the French Exposition, looking down as it does upon all the high struct-

general design of the work was adopted and well worked out, for unusual difficulties are presented by the nature of this design which render it impossible to use the ordinary lifts.

The four great legs of the tower spring from the corners of a square which measures about 375 feet on its sides, and they converge in a graceful vertical curve to-

necting by arches on each side of the square. These clear spans give architectural beauty to the design, and to avoid obstructing them, all means of ascent are placed in the legs and must conform to their curves and inclinations. In this respect the elevators are of the nature of inclined railways of very steep angle and varying gradients. The original design was to construct an

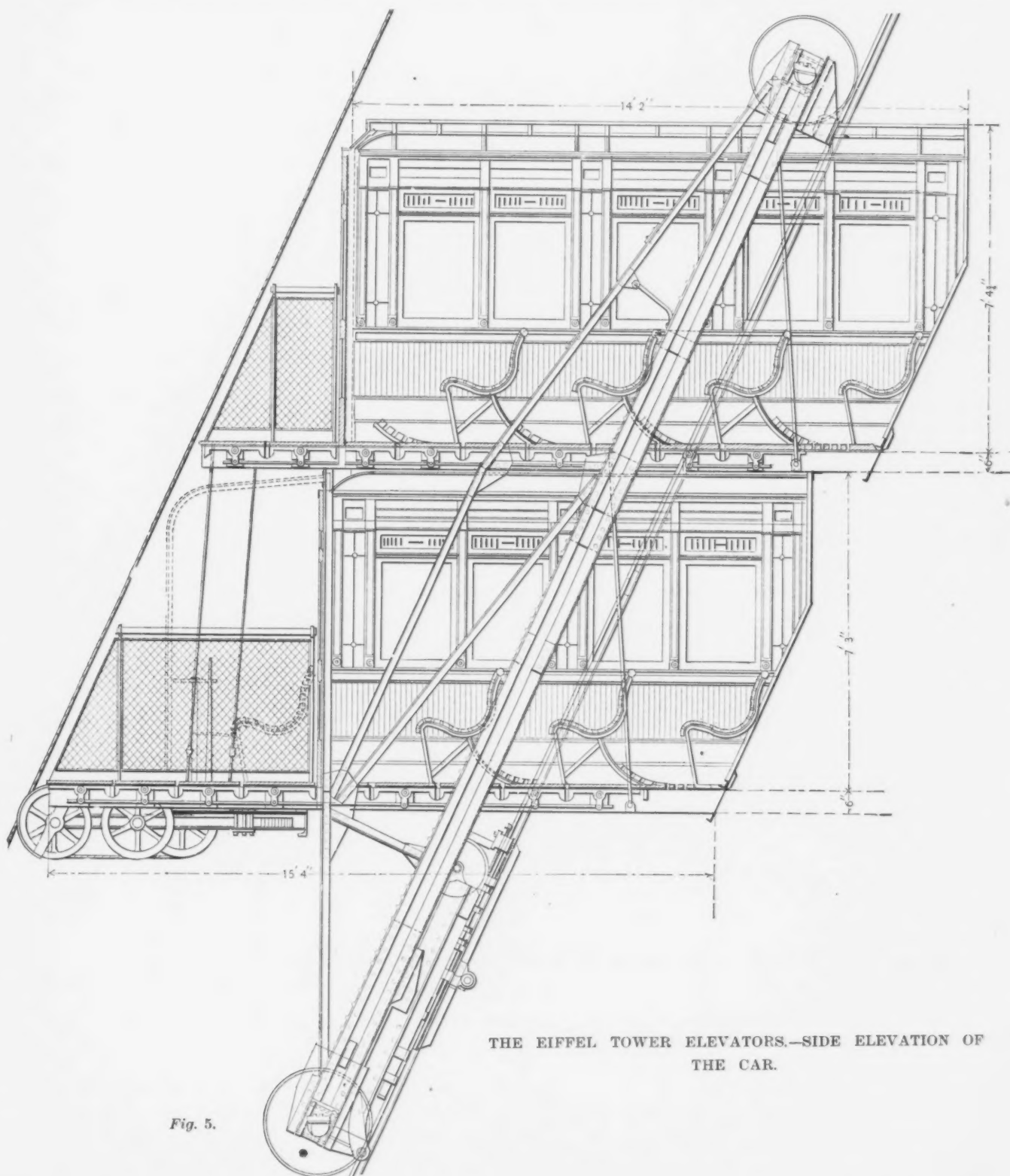


Fig. 5.

THE EIFFEL TOWER ELEVATORS.—SIDE ELEVATION OF THE CAR.

ures and monuments of the world, has been opened to the public, much interest centers in the various means supplied for its ascent. It would seem that little real thought was given to this necessary adjunct to the great structure until after the

ward the center of the square, meeting at a point some 400 feet above the foundation. Here is situated the middle landing, or second floor, and from this point the tower, more like ordinary structures, tapers to the top. The four legs are con-

ected by arches on each side of the square. These clear spans give architectural beauty to the design, and to avoid obstructing them, all means of ascent are placed in the legs and must conform to their curves and inclinations. In this respect the elevators are of the nature of inclined railways of very steep angle and varying gradients. The original design was to construct an

the middle landing. Here a change of cars is necessitated, and two elevators rise vertically in the center of the tower from the middle landing to the top. These could be of ordinary type, as only the usual conditions exist. The remaining two diagonal corners are occupied by machines rising on a straight incline to the first story, which is about midway between the foundation and the middle landing. Of these six elevators the two that present the greatest difficulties of construction, on account of their ascent at varying inclinations to the middle landing, are of American design, built by American manufacturers and successfully erected

under main-track structure, and shows the car as it approaches the level of the first landing. The profile starts at an angle of $54\frac{1}{2}^\circ$ from the horizontal; it keeps this inclination for some distance, and then, conforming to the shape of the leg of the tower, it passes by a vertical curve to an inclination of $78\frac{1}{2}^\circ$. This is maintained to the end of the run, terminating at the middle landing, 395 feet vertically above the foundation. The length on the profile line, however, is about 420 feet, which is the actual distance traveled by the car.

The track structure consists of two regular girders, built in the tower leg especially for the elevator, upon which rest

precaution is necessary to prevent their displacement; hence extra anchorages are provided at intervals, so that the force of the descending car would be transmitted

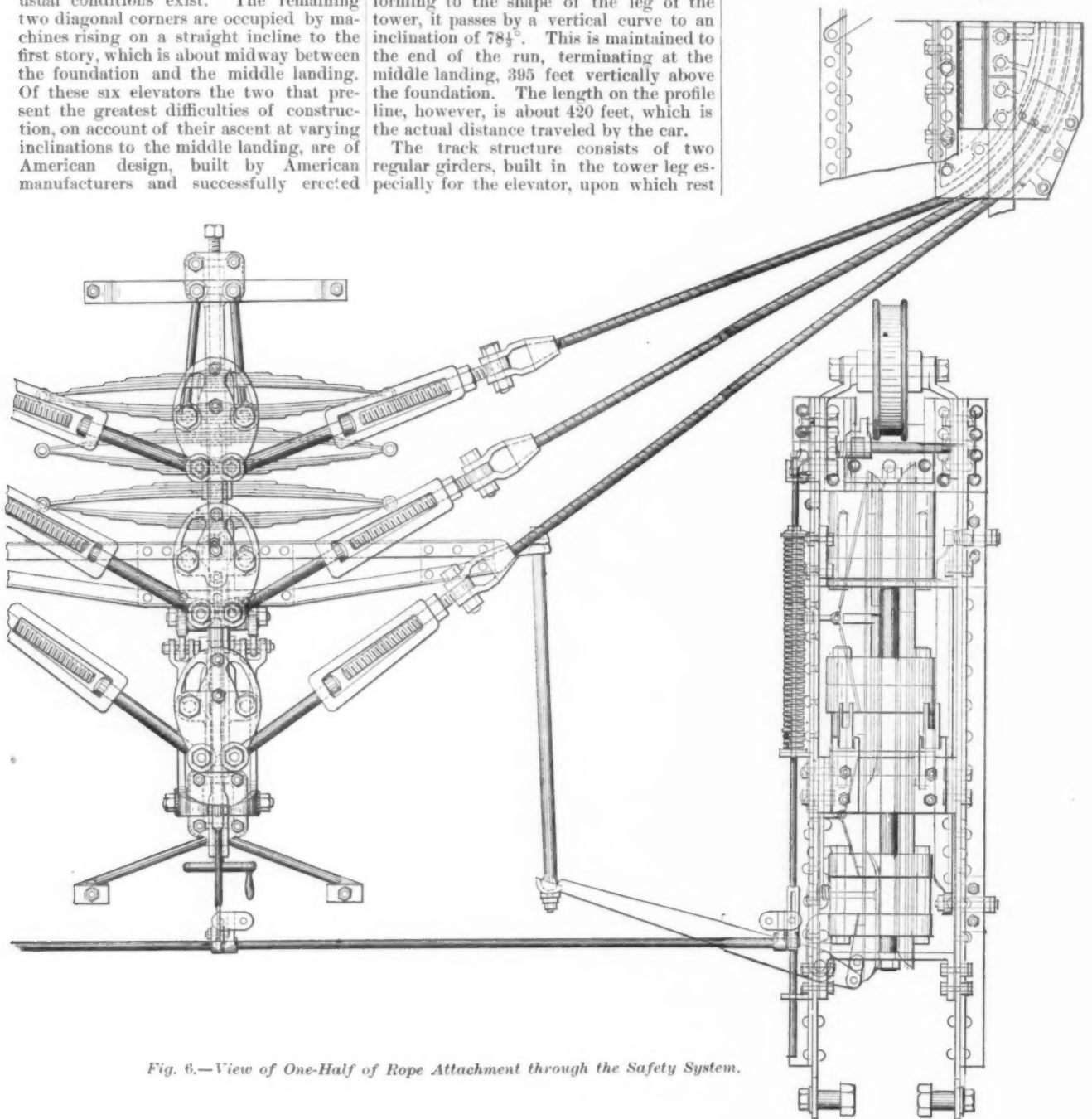


Fig. 6.—View of One-Half of Rope Attachment through the Safety System.

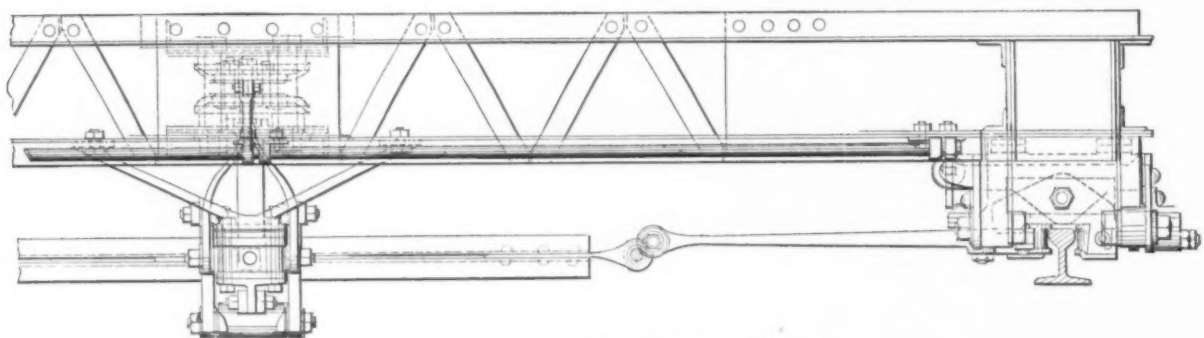


Fig. 9.—Safety Device and Frame.

under their superintendence. Fig. 1 shows a diagonal section through one leg of the tower to the height of the middle landing, and gives a true profile of track and track structure upon which the car runs. It also shows hydraulic cylinder, multiplying gear, overhead work, position of counter-balance and track, which lies directly

the rails, which are of ordinary type and are fastened to the girders in adjustable chairs in order that perfect alignment may be assured. The ends of rails are allowed to butt, it being considered that the whole inner structure will expand and contract together. In the case of the safety-grips coming into action upon the rails, every

directly to the girders without causing too long a section of rail to act as a column. The motor of the machine is a hydraulic cylinder, 42 feet long and 38 inches inside diameter, shown in detail, Fig. 2. In this moves the piston, the machine being so geared that 1 foot of movement of the piston effects 12 feet of movement of the

car. This is done by the use of the traveler, Figs. 3 and 4, a large riveted iron frame on trucks, and supporting six multiplying pulleys, each one 5 feet in diameter. To this frame the two piston-rods attach, and all moves directly as the piston.

The multiplication of speed is made complete by the use of auxiliary pulleys, which are shown at the top of cylinder girders in Fig. 1. These girders that support the cylinder, and upon which the multiplying gear travels back and forth between cylinder-head and auxiliaries, form an independent construction, and are particularly designed for the peculiar duty they are called upon to perform. Owing to the multiplication of speed, the direct pull on the piston-rods, of which there are two, is about 200,000 pounds. It was not permissible to take this pull directly upon the tower structure; hence it is transmitted by the auxiliaries back through the cylinder girders to the foundations, only such portion coming directly upon the tower, at the overhead work, as is required to lift the car and its load. The tower is, therefore, only called upon

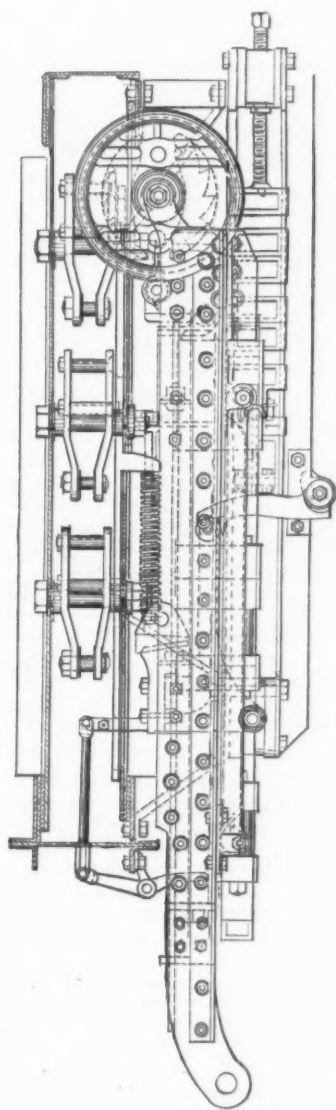


Fig. 10.—Side Elevation of Safety Device.

to support the cylinder girders and their load by means of hangers in the inclined position shown in Fig. 1, which is made as nearly vertical as possible to avoid friction and the deflection of piston-rods between supports. Four 1-inch steel ropes are fastened to an equalizing bar at the top of the cylinder girders, and after passing back and forth around each sheave of traveler and auxiliary system they lead

off the traveler to the overhead sheaves and thence to the car.

The water-pressure necessary to run the machine, 180 pounds per square inch, is obtained from tanks located near the middle landing, which are kept filled from a pumping system below. The pressure is thus admitted through the valve and circulating-pipe, Fig. 2, to act on the top of the piston, and the discharge being open from the bottom of the cylinder the piston descends, lifting its load. The valve being reversed, the bottom of cylinder connects with circulating-pipe, and the discharge being closed the car descends by its own overbalance, raising the piston and causing the water to circulate from the top of the cylinder down through the circulating-pipe to its original position under the piston; one charge of water thus answering for the complete round trip, which is the regular Otis system.

The cylinder is made of sections of cast-iron pipe 2 inches in thickness. Four 9-foot sections are jointed on the ends and bolted together through the flanges, asbestos gaskets being used between the joints to make them tight. Although 180 pounds is the working pressure, each section was tested to 450 pounds before shipping. In addition to the four 9-foot sections there is a short section at top and bottom where connection is made with the circulating-pipe and water-chest. The cylinder-head has a circle of screw-plugs, which, when removed, permit of the introduction of a long socket wrench by which the piston-packing can be tightened without removing the cylinder-head. On account of the inclined position of the cylinder and its length to avoid the consequent deflection of the piston-rods, which are 5-inch steel and over 40 feet long, supports are introduced both inside and outside of the cylinder. When the piston is at the bottom the inside spider is at the center of the cylinder and the outside spider near the cylinder-head. When the piston has risen to one-half its stroke it picks up the inside spider, which being connected with the outside spider by a rod through the cylinder-head, both are pushed along to the end of the stroke, the outside spider then being the support to the piston-rods at the midway point outside the cylinder. On the down stroke this is just reversed, the traveler at one-half the stroke picking up the outside spider and carrying it back to the cylinder-head, the inside spider being also pushed to its original position. Thus at no time during the stroke are the rods unsupported for a length of over 20 feet. The traveler with its six heavy sheaves weighs in all about 24,000 pounds, and is supported by a truck at each end, as shown in Figs. 3 and 4. A track is provided for these trucks, much the same as for the car trucks, the rails being on the cylinder girders. The position of the traveler at one-half stroke is indicated in the section Fig. 1.

Fig. 5 shows a side elevation of the car frame, with a section of the car, through the aisle and landing projections. The car is a double decker the arrangement in both top and bottom compartment being somewhat similar to an ordinary railway coach, having an aisle with the seats at right angles to it, one back of the other. The cabinet work is simply self-supporting, merely a protecting wall from the elements, and rests in the iron frame, which is designed to take all strains due to lifting or to the check of rapid motion in case the safeties are brought into action and grip the rail. To this iron frame the floor-beams of both decks are braced, upon it the ropes take their hold and in it the safeties are attached. The most peculiar feature of the car is the aisle floor, which projects out in front of the car from both upper and lower stories to meet the landing platforms, which are also double, one above the other, at each landing. This aisle

oor is constructed like a shutter, the position of the slats being under the control of the operator, by the lever indicated in the dotted lines. When the car is at the bottom it is in its most tipped-back position. The lever then being put in the proper slot, each floor slat is horizontal and makes a stairway which the passenger descends to enter the car. At the first floor the lever is placed in the middle slot; the slats are then horizontal, but form an even floor, the position of the car being a mean between its two extremes of inclination. This position is shown in the drawing. When the car is at the middle landing or the top of its ascent it may then be said to be in its most tipped-forward position. The lever being again adjusted, the slats when horizontal form a stairway which the passenger must ascend to enter the car. Thus the change of angle of the car frame is compensated for to effect landings. The seats, however, are stationary, but with such a curve to back and seat that the sitting passenger need experience no inconvenience from the change of inclination. When he takes his seat in the car at the bottom he leans well back. Upon reaching the top he finds his seat more like a straight-backed chair and his body erect.

In the lower part of the iron car-frame, down below the body of the car the safeties are attached, and through them the ropes take their hold as shown in Fig. 6, which is a view of one-half the attachment system looking at right angles to the general plane of the car-frame. It will be seen that six ropes pass from the center to the edges of the frame, three on each side, thence around saddles on the frame and up along each side of the track to the overhead work. Here by a system of sheaves they are collected and redistributed, four ropes, two from each side, passing to the first sheave on the traveler.

The remaining two ropes, one from each side, passing over and under the main car girders lead down to attach to the counter-balance, which is a riveted iron truck, Figs. 7 and 8, running on a track structure similar to main track structure and immediately back of it or below it. This loaded counter-balance frame, being thus directly connected to the car, forms a partial and adjustable balance to the weight of the car, thus decreasing by its gravity the actual load to be lifted by the action of piston in cylinders. The car, however, must not be fully counter-balanced, for as already stated a portion of its weight is necessary to the down trip and the raising of the piston. Owing to the construction of the tower the counter-balance track is but one-third of the length of the car track and does not extend above the first inclination of the grade line, hence the counter-balance frame is so geared as to travel but one foot while the car travels three feet. The weight of counter-balance is necessarily increased in the same proportion to be effective. The weight of the empty car uncounter-balanced, with all its attachments, safeties, &c., is 24,000 pounds; with full load 32,000 pounds. The water pressure is therefore required to overcome all friction, weight of ropes, &c., and lift the live load of 8000 pounds, plus the over-balance of car, at the rate of 400 feet per minute, which illustrates the net working power of the machine. The safeties are an adaptation of the compound wedge safety used on Otis passenger elevators, the action of these wedges when called into operation being to grip the rail, not with full power at once, but with constantly increasing force until the resistance becomes sufficient to overcome the momentum and weight of the car. In the present case these wedges are arranged upon shoes which when not in action clear the rail, the whole mechanism being contained in a riveted iron frame

pivoted to the car-frame at lower end, and supported by governor-wheel at upper end, the governor-wheel running upon the rail, and having a speed due to the velocity of the car. This is indicated in Fig. 5, and Figs. 9 and 10 show two views of safety frames more in detail. The initial power on the first wedge, which starts the compounding action of the wedges, is obtained from springs in car frame, Fig. 6. These springs are released from two causes, (1) the breaking of one or any number of the ropes, and (2) by undue speed from any cause. This latter is affected by the wheel-governor already mentioned, to which there are attached toothed weights. These weights, up to a car speed of 400 feet per minute, remain in the center of the wheel, but greater velocity throws the weights by centrifugal force to the outside rim of the wheel, where their teeth engage the necessary mechanism to release the springs. Figs. 11 and 12 show device for operating hand-rope. This is under the projecting aisle of car,

sons, Clarkson C. in Detroit, Fred F. in Chicago, and Theodore K. in St. Louis. The failure is laid wholly at the door of the Chicago branch. The Detroit house has been well managed and can meet all its liabilities, but the Chicago branch is badly off, and St. Louis is also somewhat behind. The total liabilities are placed at \$130,000, with assets estimated at \$45,000. The Detroit manager asserts positively that he will resume as soon as he can get freed from the present entanglements, and it is highly probable that the St. Louis branch will open again also.

The Western Wages Scale.

Advices from Pittsburgh state that there will be no conference this year between the iron manufacturers and the workers on the annual wage scale. This will be the first time in the history of the Amalgamated Association of Iron and Steel Workers, which was organized in 1874,

Association, Mr. Weeks replied that there was no way by which they can get together a committee to represent the Association of Manufacturers of Iron, Steel and Nails, as it is not now in existence. There is nothing now left for the Amalgamated Association to do but formulate its new scale and present it to each firm through the proper committees. Now let every member of the Amalgamated Association keep his own counsel. Do all your business with your firm through the proper committee, and in no other way, and await results.

The members of the Amalgamated Association do not anticipate any trouble this year, notwithstanding the fact that the manufacturers will not confer with them. None of them will venture a prediction as to what demand they will make, but all agree that it can be safely stated that the present scale, with some slight modifications, will be presented. The only hitch will be with the steel scale. The announcement of Carnegie, Phipps & Co. that they will postpone the date fixed for signing the Homestead scale until June 10, in order that the Amalgamated convention may consider it, is an indication

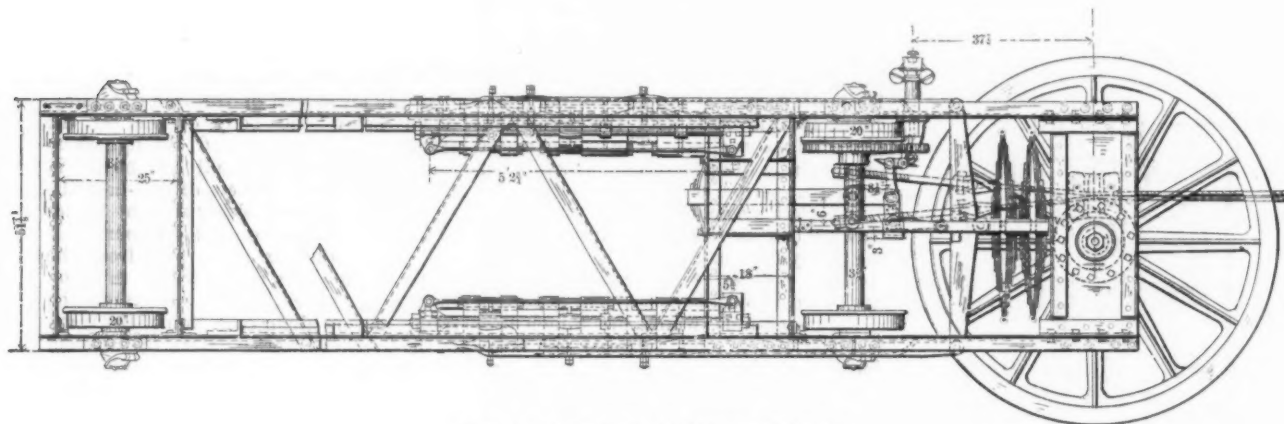


Fig. 7.—Plan View of Counter-Balance

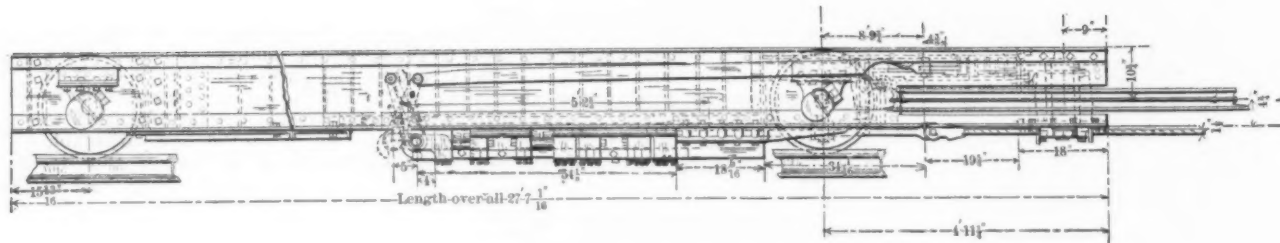


Fig. 8.—Side Elevation of Counter-Balance.

with hand-wheel for operator, as shown in Fig. 5. The operating rope is continuous, and passes around the valve-sheave at foot of cylinder. This valve-sheave is balanced in position by a weight, which, if operating rope should part, would in falling close the valve.

Thomas E. Brown, Jr., chief engineer of Otis Brothers & Co., has devoted the better part of two years to the design, manufacture and erection of these machines, and it is due to his untiring energy that this American company supplied the great tower with these powerful inclines, for which no foreign competitors were able to present, even to their own governments, designs which could be accepted.

The old-established machinery firm of G. S. Wormer & Sons, of Detroit, made an assignment on the 31st ult. A dozen years ago it started branches in Chicago and St. Louis. All three stores are included in the assignment. The firm handled engines, boilers, wood-working machinery, &c., but the St. Louis house made a specialty of engines and heavy mining machinery. The senior partner retired several years ago, and the three houses have been since managed by as many

that a conference has been refused by the manufacturers. In past years the Manufacturers' Association handled all such questions and appointed committees to meet the workers. A. F. Keating was president and Joseph D. Weeks was secretary of the organization. This association, however, went to pieces last year, and when President Weihe, of the Amalgamated Association, addressed a formal note to Secretary Weeks announcing that they were about to draw up a scale of wages for the coming year and would appoint a committee to confer with a like committee of manufacturers, he received a reply from Secretary Weeks that there was no association of manufacturers and no committee could be appointed. There will, therefore, be no conference with the iron masters this year, and the lodges in each mill will present the scale to the different firms. The scale will be uniform, and if any firm objects to a clause in the scale and it is modified all other firms will have the same advantage. Secretary Martin has issued the following to the members of the association:

In reply to the request of President Weihe to the manufacturers, through Mr. Joseph D. Weeks, to name a day when they could meet a conference committee of the Amalgamated

that the firm do not intend to adopt a rough-shod course. This trouble may be satisfactorily settled. If war is declared it is claimed that the workers can stand a siege of eight weeks very comfortably, as the funds in the treasury are larger than usual. The *Labor Tribune*, in commenting on the wage question, editorially says:

There seems to be considerable trouble in the newspapers about the arrangement of the figures of the coming scale year, and it may be that this may extend into the iron and steel industries before the annual signing is done; however, it is hardly within the probabilities that there will be difficulties equal to those that have been in some years in the past. The situation has its main peculiarity in that trade has been so very good in England that wages have been advanced materially, while in America this has not been the case. As might be expected of business men, the mill owners take the opportunity presented by these conditions to endeavor to make a few points on wages and on the terms of labor. There is nothing surprising in this; it would be surprising were they to permit the chance to pass unimproved.

While it is yet a little early to predict the outcome, it is the impression among the manufacturers that a shut-down of the mills for two or three weeks will take place, after which a scale will be agreed upon that will be satisfactory to both manufacturer and workman.

Cambria Iron and Steel Works.

Magnitude of the Establishment.

The following description and history of the Cambria Iron Company's works, at Johnstown, Pa., partly destroyed by flood on May 31, is mainly taken from a report prepared by the Pennsylvania Bureau of Industrial Statistics:

The great works operated by the Cambria Iron Company originated in a few widely-separated charcoal furnaces, which were built by pioneer iron-workers in the early years of this century. The company's charter was granted in the year 1852. Johnstown was then a village of 1300 inhabitants. The Pennsylvania Railroad had only been extended thus far in 1852, and the early iron manufacturers rightly foresaw a great future for the industry at this point. Coal, iron and limestone were abundant. In 1853 the construction of four coke furnaces was commenced, and it was two years before the first was completed, while some progress was made on the other three. A mill for rolling iron rails was also built. England was then shipping rails into this country under a low duty, and the iron industry, then in its infancy, was struggling for existence. The furnaces at Johnstown labored under greater difficulties in the years between 1852 and 1861 than can be appreciated at this late day. Had it not been for a few patriotic citizens in Philadelphia, who loaned their credit and means to the company, the city of Johnstown would probably never have been built. Notwithstanding the protecting care of the Philadelphia merchants, the company in Johnstown were unable to continue in business, and suspended in 1854. Among their heaviest creditors in Philadelphia were Oliver Martin and Martin, Morrell & Co. More money was subscribed, but the establishment failed again in 1855. D. J. Morrell, however, formed a new company with new credit.

The year 1856 was one of great financial depression, and the following year was worse. To render the situation still more gloomy, a fire broke out in June, 1857, and in three hours the large mill was a mass of ruins. So great was the energy, determination and financial ability of the new company that in one week after the fire the rolls were once more in operation under a temporary structure. When the war came and with it the Morrill tariff of 1861 a broader field was opened up. Industry and activity in business became general; new life was infused into every enterprise.

STEEL PLANTS ERECTED.

The Cambria Iron Company began the erection of Bessemer steel works in 1869, and sold their first steel rails in 1871 at the ruling price of \$104 a ton. The history of the company from that time on shows a constant increase in plant. About ten years ago the Gautier Steel Company, Limited, were organized to manufacture, at Johnstown, wire and various other forms of merchant steel. Within less than a mile from the main works extensive mills were erected, and the business soon grew to great proportions. In a few years much additional capital was required, owing to the rapidly-increasing business, and the Cambria Iron Company became the purchaser of the works, now known as the Gautier Steel Department of Cambria Iron Company.

THE WORKS IN THEIR LATEST DEVELOPMENT.

The blast-furnaces, steel-works and rolling-mills of the company are situated upon what was originally a river flat, where the valley of the Conemaugh expanded somewhat just below the borough of John-

town, and now forming part of Millville borough. The arrangement of the works has been necessarily governed by the fact that they have gradually expanded from the original rolling-mill and four old-style blast-furnaces to their present character. The Johnstown furnaces, Nos. 1, 2, 3 and 4, form one complete plant, with stacks 75 feet high, 16 feet diameter of bosh. Nos. 5 and 6 blast-furnaces form together a second plant, with stacks 75 feet high, 19 feet diameter of bosh. The Bessemer plant was the sixth started in the United States (July, 1871). The main building is 102 feet in width by 165 feet in length. The cupolas are six in number. There are two vessels of 8½ tons capacity each, the products being distributed by a hydraulic ladle crane. The best average, although not the very highest work done, in the Bessemer department is 103 heats of 8½ tons each for 24 hours. The best weekly record reached 4847 tons of ingots, the best monthly record 20,304 tons, and the best daily output 900 tons ingots. All grades of steel are made in the converters, from the softest wire and bridge stock to spring steel. All the special stock—that is, other than rails—is carefully analyzed by heats, and the physical properties are determined by a tension test. A new two-vessel Bessemer plant was just completed this spring, and had incorporated in it the very latest improvements and appliances for the manufacture of steel.

The open-hearth building, 120 feet in width by 155 feet in length, contains three Pernot revolving-hearth furnaces of 15 tons capacity each, supplied with natural gas. A separate pit, with a hydraulic ladle crane of 20 tons capacity, is located in front of each pan. In a portion of the mill building, originally used as a puddle mill, is located the bolt and nut works, wherein are made track bolts and machine bolts. This department is equipped with bolt-heading and nut-making machines, cutting, tapping and facing machines, and produces about 1000 kegs of finished track bolts, of 200 pounds each, per month, besides machine bolts. Near this also are located the axle and forging shops, in the old puddle mill building. The axle shop has threesteam hammers to forge and ten machines to cut off, center and turn axles. The capacity of this shop is 100 finished steel axles per day. All axles are toughened and annealed by a patented process, giving the strongest axle possible. In the forging plant, located in the same building, there is an 18,000-pound Bement hammer and a 10-ton traveling crane to convey forgings from the furnaces to the hammer. There are two furnaces for heating large ingots and blooms for forgings. The blooming-mill contains two large blooming trains and eight Siemens heating-furnaces. The rail mill has six trains and ten heating-furnaces. The mill plant also comprises a wire-rod mill, making 80,000 pounds each turn. A ventilating fan supplies fresh air to the mills through pipes located overhead and having outlets near the heating-furnaces. One hundred thousand cubic feet of fresh air per minute is distributed throughout the mills. The mill has in addition to its boilers over the heating-furnaces a brick and iron building, located near the rail mill, 205 feet long and 45 feet wide, containing 24 tubular boilers, aggregating about 2000 horsepower.

The Gautier Steel Department, situated in another part of the town, consists of a brick building 200 x 500 feet, where the wire is annealed, drawn and finished; a brick warehouse 373 x 43 feet; many shops, offices, &c.; the barb-wire mill, 50 x 256 feet, where the Cambria link barb wire is made, and the main merchant mill, 725 x 250 feet. These mills produce wire, shafting, springs, plow-share, rake and harrow teeth and other kinds of agricult-

ural-implement steel. In 1887 they produced 50,000 tons of this material, which was marketed mainly in the Western States. Grouped with the principal mills are the foundries, pattern and other shops, drafting offices, time offices, &c., all structures being of firm and substantial character. The company operate about 35 miles of railroad tracks, employing in this service 24 locomotives, and they own 1500 cars. In the fall of 1886 natural gas was introduced in the works.

OTHER ENTERPRISES UNDERTAKEN.

Anxious to secure employment for the daughters and widows of the employees of the company who were willing to work, the management erected a woolen mill which now employs about 300 persons. Amusements were not neglected, and the people of Johnstown are indebted to the company for the erection of an opera-house, where dramatic entertainments are given.

The company own 700 houses, which are rented exclusively to employees. The handsome library erected by the company and presented to the town was stocked with nearly 7000 volumes. The Cambria Hospital is also under the control of the beneficial association of the works. The Cambria Club-house is a very neat pressed-brick building on the corner of Main and Federal streets. It was first opened in 1881, and is used exclusively for the entertainment of the guests of the company and such of their employees as can be accommodated. The store building is a four-story brick structure on Washington street, with three large store-rooms on the first floor, the remainder of the building being used for various forms of merchandise. Including the surrounding boroughs, all of which are built up solidly to Johnstown proper, the population is about 30,000. The Cambria Iron Company employ, in Johnstown, about 7500 people, which would certainly indicate a population of not less than 20,000 depending upon the company for a livelihood. A large proportion of the population of Johnstown are citizens of foreign birth or their immediate descendants. Those of German, Irish, Welsh and English birth or extraction predominate, with a few Swedes and Frenchmen. As a rule the working people and their families are well dressed and orderly; in this they are above the average. Most of the older workmen of the company, owing largely to their liberal policy, own their houses, and many of them have houses for rent.

THE PARTIAL DESTRUCTION OF THE WORKS BY FLOOD.

Having passed through financial reverses, overcome losses by fire and reached a most important position in the industrial world, the company have now encountered the severest check to their prosperity in the damage wrought by the flood of May 31. The latest telegraphic dispatches state that the Gautier Steel Department has been completely wiped out of existence and that the Cambria Works proper have been very seriously damaged. The extent of the damage will not be known for some time, but a very large outlay of capital will undoubtedly be required to put these works in running condition, while the Gautier Department will have to be wholly rebuilt. The company announce that operations will be resumed as quickly as possible. They are fortunate in having assets largely beyond their investments at Johnstown. The greatest loss which they suffer is really in the loss of officers and men who have devoted their lives to the prosperity of the company.

The Buffinton steel works, at Burlington, Iowa, were destroyed by fire on the 29th ult. Loss, \$50,000; insurance, \$27,000. The works employed about 100 men.

Bits of Engine-Room Experience.*

About the middle of the year 1888 I had charge of a Buckeye engine, in which a mysterious pounding noise one day appeared. It proved upon examination to be in the cylinder, and was caused by the packing rings striking against a shoulder which had been worn at each end of the bore. How this occurred will be quite clear from an inspection of Fig. 1, which

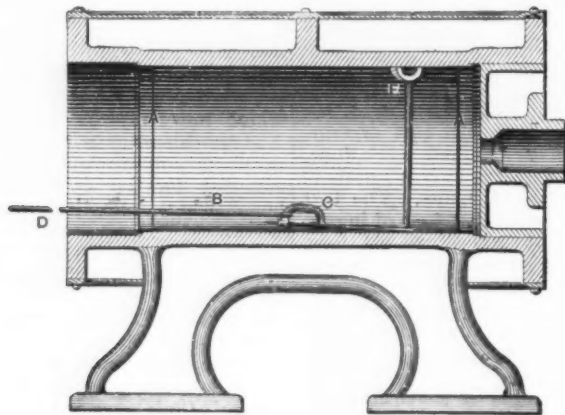


Fig. 1.—Longitudinal Section of Cylinder.

represents a longitudinal section of the cylinder of an 18 x 36 inch Buckeye engine. The shoulder is represented at AA, and it was formed in this wise: The piston-packing was of the type shown in Fig. 2, where A represents a cross section of the cylinder and B the piston. The two piston-packing rings were cut to

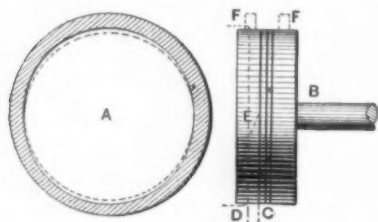


Fig. 2.—Piston Packing.

break joints, and occupied a groove $\frac{1}{4}$ -inch wide in the center of the piston, as shown at C. It will be seen at once that these rings do not travel the entire length of the bore, but stop in this case $1\frac{1}{2}$ inches short at each end, as shown by the dotted line D.

From the center E upward this shoulder was worn quite sharp, while from E downward the shoulder was less marked, for the reason that the piston wore the bottom of the cylinder, as shown by the dotted line extending from E downward. An exaggerated case is shown by the dotted lines in the cross section of cylinder, A. The Buckeye Company, I am glad to learn, have abandoned this style of packing, and now use spring rings similar to those that I put in place of the kind removed. These rings were $\frac{1}{4}$ -inch square, and traveled over each end of the bore $\frac{3}{8}$ inch, as shown by the dotted lines FF. To put this packing in the shoulder shown at AA had to be removed. It was a comparatively easy matter to file off the shoulder at the back end when the head was removed; but to file off a belt of cast iron $1\frac{1}{2}$ inches wide, $\frac{3}{8}$ inch thick and 56.70 inches long in the crank end of an 18 x 36 inch cylinder is not such an easy job. This engine had to run every night, starting at 4.30 p.m.

* Paper read by Lewis F. Lyne, of New York City, at the Erie meeting of the American Society of Mechanical Engineers.

and stopping at 6.30 a.m.; so it will be understood that the cylinder did not have time to cool sufficiently to make the interior a very desirable place to work in. The way we did it was this: A rod, B, of $\frac{1}{4}$ -inch round iron was provided with an eye turned on one end, to slip over the offset file-handle C, generally used by machinists for filing flat surfaces. This rod was left sufficiently long to reach outside the cylinder, as shown, so that a workman

standing close to the end of the cylinder, at D, could work the 14-inch bastard file which was used on this occasion.

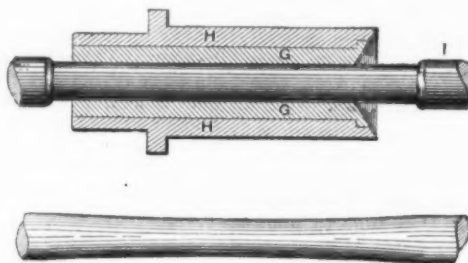
I used what is known as a safe-edge file, on account of its having a broad end, thus giving more surface for cutting. I had an old rubber spring which was cut in two; then with a tenpenny nail one half of this spring was fastened to the end of a broomstick, as shown at E. The broomstick was sawed of a proper length, so that when placed across the cylinder inside a sufficient pressure could be thrown upon the end of the file. We were now ready for business, so a sperm candle was placed in a $\frac{1}{4}$ -inch hexagonal nut, and after being lighted was placed close to the head of the cylinder. A rubber hose was attached to a common bellows, and supplied fresh air through the stuffing-box. In just two and a half hours from the time of commencement the shoulder at this end of the cylinder was removed.

While I am on this subject I cannot refrain from condemning all forms of piston-

cylinders so that shoulders could be worn at the ends. I mean this to apply to pumps of all descriptions and air compressors, as well as to steam-engines; for I have met and remedied this same difficulty time and again in overhauling various kinds of machinery. I remember on one occasion, where the cross-head gibs on a certain steam-engine were adjusted when the piston stood at half stroke, there was a shoulder worn on each end of the guides, so that when the engine started the cross-head was split open when it reached the shoulders. So it will be seen that this principle applies not only to cylinders, but to guides as well. In short, where there is reciprocating motion great care should be taken to have the gibs or slides wipe over to prevent the formation of shoulders. To be sure, such instances are becoming more rare on account of the better diffusion of practical knowledge through our technical schools; but there are hundreds of steam-engines and pumps where these shoulders should be taken off and recesses cut in their places.

VALVE-STEMS.

A common mistake is made in turning valve-stems of a uniform diameter throughout, so that, after they have been in use a year or so, one has to either throw away the stem and get a new one or resort to some such wrinkle as I am about to describe. The valve-stem, as it wears, assumes the form shown in Fig. 4, so that it is entirely out of the question to keep it tight, except at each end of the stroke, where it jams so tightly that one is in danger of tearing some of the valve-motion apart. I once knew a locomotive rock-arm to be sprung $\frac{1}{8}$ inch out of its original shape by screwing the packing too tight on a badly worn valve-stem. A valve-stem of the kind first described became badly worn upon an engine under my direction, and its shape very much resembled Fig. 4; so I put it in a lathe and trued it up, letting the cut run about 2 inches each end beyond the point where stem would travel when in use. The job was to get a gland and junk-ring on that stem so that they would fit. This is how it was done: A brass bushing was sawed through longitudinally, and the joint filed to a fit. I then with soft-solder sweated them together, using the slightest quantity of solder. I then bored this bushing to fit the stem, and turned it to easily fit the



Figs. 3 and 4.—Valve Stems.

packings that do not wipe over the entire ends of the bore, to avoid the slightest possibility of wearing a shoulder. I remember an instance that happened on a tugboat in 1882, where a 20-inch cylinder was split the entire length because the piston-ring swedged against a shoulder worn at the end of the bore. The engineer had been taking up the main-rod brasses the day before, and in so doing the rod was lengthened so that the packing rings, which were of the old-fashioned spring type, being stuck fast, split the cylinder as described. If the rings travel over the end into the counterbore there is no possibility of such an accident. I never could ascertain why any engineer could design

original junk-ring, which had been previously bored out and recessed, as shown in Fig. 4.

When finished the bushing was warmed to melt the solder, when it fell apart. I then slipped the ring H over the valve-stem I, and placed the two parts of the bushing G in place. It will of course be understood that when in the stuffing-box the packing will prevent this bushing from moving, so that for all practical purposes it is as good as if it were all solid. The ring J which fits in the bottom of the stuffing-box is made in the same manner as that of G, except when put on the stem a drop of solder is used to join it; but when once inside the stuffing-box it does

not matter whether it is in two pieces or one.

The practice of making the threads on the ends of piston-rods of equal diameter with the rest of the rod ought to be condemned for several reasons. The principal one is that the rod cannot be trued up and used without resorting to a split gland bushing; and when metallic packing is used it is necessary to remove that packing whenever the piston-rod is taken out of the cylinder. The reason is that the threads on the end of the piston-rod would tear it all to pieces in drawing it back through the stuffing-box. If the thread were of a smaller diameter than the body of the rod, as it should always be, then there would be no necessity of disturbing the packing, and the rod could be trued and replaced, requiring only a plain bushing for gland and for junk-ring.

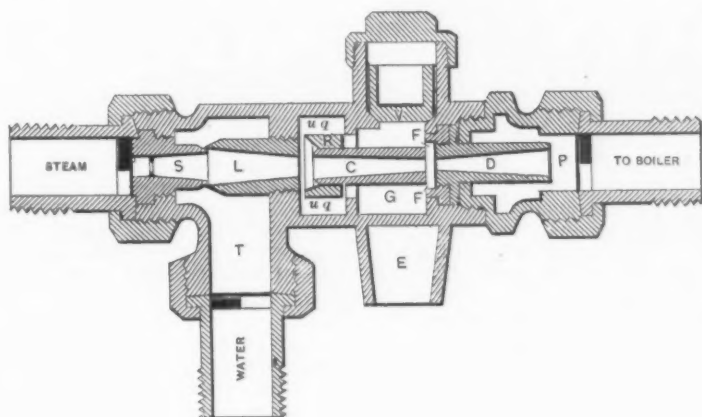
RENEWING ENGINE BED.

The above engine, when first set up, rested on a bed of sulphur, which after a time began to disintegrate and work out. Mr. Lyne's method of remedying this evil was simple and effective: "Four pieces of flat iron, $\frac{1}{2} \times 4$ inches, were cut off. These we reduced in thickness so as to just fill the space between the top of the cap-stones and the cylinder feet. We

forming the dam preventing the metal from running out at the sides. No one who has seen it doubts that this cylinder is fixed forever."

Automatic Injector.

The automatic injector of which we herewith present an engraving has few working parts and is extremely simple in operation. Steam enters through the jet S, passes into the chamber G through the jet L, causing the auxiliary check R to slide along the tube C; the steam, lifting the valve V, passes out freely through the overflow E, drawing the air out of the chamber T, in which a vacuum is created that lifts the water from a lower level. As soon as the water reaches the chamber T the steam is condensed and a velocity imparted to the water, which passes on into the chamber G, and as the velocity increases passes through the tube C and spills through the openings F F, forcing the auxiliary check R back on the tube C. When it reaches the projections q q the vacuum carries it on by the same to its original position, as shown in the drawing. As soon as the water attains sufficient velocity to overcome the boiler pressure it passes on through the tube D, thereby



THE METROPOLITAN AUTOMATIC INJECTOR.

dug out the sulphur by the side of each anchor bolt, of which there were four, two in each foot; we slacked the nuts of the foundation bolts, then put in the liners, one for each bolt, and screwed them fast. The sulphur was then removed from one foot at a time, and the space thoroughly scraped out. We then took two strips of lath and wrapped sufficient paper around each of them to fill the space between the stone and foot, thus dividing the space into three equal parts. This was done because it would take more metal to fill the space than could have been conveniently handled. We placed strips of laths edgewise all around the foot and backed them with fire-clay. An opening was left at each of the four corners—two for risers and two diagonal corners for pouring metal, leaving a head of about 2 inches, to better insure a solid casting. Some powdered resin was thrown into the gates to absorb the moisture and prevent the casting from blowing. Having previously melted in an iron pot a mixture composed of nine parts of lead, two of antimony and one of bismuth (commonly known as expansion metal), we poured from two ladles, and in about ten minutes had the satisfaction of finding that our cylinder was as securely held as if it had been originally bedded on the solid stone. We poured the outer spaces of each foot first, then removed the two strips of lath and poured the middle space, the two outside castings

causing a vacuum in the chamber G, which closes the valve V. When the machine is working there is a direct communication between the secondary spill F F and primary overflow through the ports u u on the auxiliary check R, which enables the injector to work very hot water. In starting the injector the passage between the primary and secondary overflows is automatically closed for an instant, then automatically opened when the injector is working. The steam-supply pipe and the suction-pipe are provided each with a valve to regulate the flow of steam and water respectively. A valve is also placed on the delivery-pipe. It will be seen that while the parts are few and easy of access the injector is automatic and reliable in its action. This injector is the invention of John Desmond, and is manufactured for Jenkins Brothers, of New York, Boston, Chicago and Philadelphia.

Proposed New Steamship Line.

Western men are interesting themselves in a proposed steamship line from Tampa Bay to Aspinwall, designed to promote direct trade between Southern points and the West at the expense of New York. A memorial, signed by members of the St. Louis Merchant's Exchange, cites the fact that it has been shown that many millions of dollars can be saved to the people of the Western, Middle and Southern States on goods from Cuba, Central America,

South America and Mexico that now come by the way of New York and the Atlantic seaboard, passing out of the Gulf of Mexico and the Caribbean Sea through the dangerous reefs of Florida and by Cape Hatteras to reach New York, entailing an extra insurance of 24 per cent., and a loss on vessels of \$10,000,000 yearly, saying nothing of the \$1,500,000 loss per year on perishable goods by long shipment. It has also been shown that \$265,000,000 worth of commerce passes and repasses yearly to the Eastern seaboard over this dangerous route, and that out of this amount \$165,000,000 worth is consumed, handled and manufactured west of and including the State of Ohio. Attention is then called to the advantages of Tampa Bay as a harbor, and to the fact that by making use of it all this heavy loss and increased cost of insurance can be saved to the consumer, and at the same time a large volume of business can be given to the Southern and Western roads in carrying these goods direct to St. Louis, Chicago and Cincinnati, the neutral inland markets of the country. Congress is asked for \$1,000,000 in aid of the scheme.

A New Sound Steamer.

The Providence and Stonington Line have added another handsome steamer to their already large fleet. The new boat has been christened the Connecticut. She was built at the yard of Robert Palmer & Sons, at Noank, Conn., and is in every way a fine piece of marine architecture. In many material respects she differs from all other steamers plying on Long Island Sound. Her principal dimensions are: Length over all, 357 feet; length on 11-foot load-line, 345 feet; beam outside of hull planking, 48 feet; extreme width over guards, 87 feet; depth of hull, 17 feet 3 inches; extreme depth forward, 26 feet; extreme depth aft, 20 feet; extreme height from bottom of keel to top of pilot-house, 60 feet. The bow lines are 171 feet long, about half her length, then a short parallel body, then the stern lines, which are sharper than ever seen in other boats of this class. By this arrangement the center of displacement is so far forward that all freight may be stowed forward of the main deck saloon. The engines are about 40 per cent. lighter than the ordinary beam engines of same power, and were built by the Wm. Cramp & Sons Ship and Engine Building Company, of Philadelphia, Pa. The engines are of the type known as double expansion, compound, inclined, direct-acting, surface condensing oscillators, with cylinders 56 inches and 104 inches diameter and 11 feet stroke of pistons. She also has feathering paddles, two air-pumps, four feed-pumps and two bilge-pumps, worked by independent compound engine, and an independent surface condenser fitted to work with all pumps, dynamos and donkey-engines. Steam is supplied by six boilers, 12 feet 6 inches diameter, 20 feet 3 inches long, set fore-and-aft in two nests of the boilers each, having athwartship fire-rooms at extreme ends. The boilers are of steel, built to carry 120 pounds of steam, and have two smoke-pipes placed fore-and-aft, 8 feet 6 inches outside diameter. When working full power, with engines making 30 revolutions per minute, this machinery is expected to develop nearly 6000 horse-power. To do this the vessel will be fitted with two blowers, each having a capacity of 40,000 cubic feet of air per minute, which will be used for forcing fires. The total weight of this machinery, including water in boilers, will be about 1000 tons. The vessel is expected to make 20 miles an hour when working full power.

An Important Railroad Decision.

The decision of the Executive Board of the Interstate Commerce Railway Association, on the request of the Alton and Burlington railroad companies for a reduction of the lumber rate from Chicago to the Missouri River, was made public on the 28th ult. by Chairman Walker. The decision is an extremely voluminous one, and refuses the request for the reduced rate. The summing up is as follows:

"We do not feel justified in authorizing the Chicago and Alton and Chicago, Burlington and Quincy companies to make the proposed reduction to 10 cents per 100 pounds. Such a step would greatly disturb the lumber rates of all the lines and would almost inevitably result in great loss, even to some which are not involved directly in the controversy. It would probably be met by reductions on the part of the Southern lines which could not be confidentially affirmed to be altogether unjust. It would no doubt for a time afford increased tonnage to the roads which are seeking it, but the tonnage without profits is of no value except for advertising and statistical purposes, and to inflict direct losses upon the income of associated lines for the purpose merely of making an exhibit of enlarged tonnage when no net revenue above expenses is in sight would be consistent neither with the principles of this association nor with ordinary consideration for the rights of others.

"The proposed 10-cent rate would practically be a war rate, and only justifiable as such. It is the part of wisdom to count the cost before taking the sword. A conflict is proposed which may entail losses upon the various contestants amounting to millions of dollars. The Executive Board regards the proposed 10-cent rate as one which is not justified by existing circumstances, which would be of no practical or substantial advantage to the roads which ask it, which would invite immediate reductions by the Southern roads and thus would neutralize itself and which would work great injury to other lines in this association. The finding, therefore, is that the rate cannot properly be authorized."

The decision, as a whole, is probably the most important ever delivered concerning Western roads. The whole question is thoroughly gone into, both sides being fully stated. As representing the effect of Interstate Commerce Commission training on Chairman Walker, the following paragraph is significant:

"No common carrier can be justified in engaging in a general rate war to punish an adversary or to redress a wrong. In so doing it not only sacrifices the immediate income of its own stockholders and the interests of all for whom its administration is directly conducted, but also inflicts great injury upon the public at large, which finds its business plans and enterprises thrown into confusion, the prices of the commodities unsettled and eventually in one way or another is called upon to pay the bill. The employment of retaliatory methods is no longer admissible. The country is aroused to the wrongs that they involve, both to railway owners and to shippers. If the farmers cannot stop them it is obvious that the State must interfere."

It now remains to be seen whether the companies interested will abide by this decision or not. If they do, it will be a decided guarantee in favor of harmonious action in the future.

Professor Friend was the mechanical expert in constructing machinery for the alleged bogus electric sugar process and possessed all the secrets. How to maintain this secrecy in giving out contracts for the job was a source of much embarrassment W. H. Cotterell, ex-president of the company, in his testimony be-

fore Recorder Smyth, said: "The professor hit upon a novel plan to impress the company with the secrecy which was to be maintained in the manufacture of the machinery. For this purpose he wrote an affidavit, which he had photographed, and which he said that every workman employed to make the secret machinery would have to swear to. This affidavit was very lengthy and bound the workman never to reveal to any one, not even his employer or his wife, the character of the work he was engaged at, or the person for whom it was done, or the object of it. A copy of one of these remarkable affidavits was shown the jury. Friend further told the company that this secret machinery, to avoid any possibility of its nature being discovered, was made in pieces in various parts of the country, and the parts were all shipped to him. Of course their manufacture was expensive, and this occasioned his constant demands for money."

The Verrugas Viaduct Destroyed.

Writing under date of March 28 from Lima a correspondent says:

"Since the termination of the war with Chili no such misfortune has happened to Peru as the recent and unexpected destruction of the Verrugas Viaduct, on the Moya Railway, at a point 40 miles from Lima, and connecting the coast with the vastly wealthy interior. On Saturday afternoon last a water cloud suspended over one of the lofty mountains covering the bridge broke, and an immense column of water was precipitated on the hill, carrying with it in its downward course huge boulders and granite rocks, which were hurled against the center column of the viaduct, destroying it completely, and causing the remainder of the structure to fall, owing to the surrender of the base. The ruin was complete, and the whole work of destruction did not occupy ten minutes. The Verrugas Viaduct was built at Baltimore in 1874, at a cost of \$500,000, and put in position the same year. It measured 575 feet in length and was 260 feet in height, making it the highest structure of the kind known save one since erected in the United States. Its lines were graceful, and engineers and scientific men from all parts of the world came to admire and acknowledge it as an engineering triumph. To talk now of repairing it is out of the question; the Government is penniless, and the contractor cannot be called upon to incur the expense, any more than a man occupying a house destroyed by fire, independent of his will, could be. How the resources for rebuilding—nearly \$1,000,000—are to be found is a problem not yet solved. Not only the material work of interruption is to be deplored, but the markets of Lima and Callao will be deprived of their customary supplies, and the cost of all the necessities of life, now so exaggerated, will rise to a fabulous price. The enormous amount of ore formerly carried over the road must now seek the antiquated method of mule-back, so increasing the measure of freight as to render it practically valueless. The great establishment of Messrs. Bockers & Johnston, recently erected to consolidate base ores at a large expenditure, is rendered comparatively useless, and the great furnishing houses at Lima are left without their customary buyers. The interior will be deprived of all its supplies, and mining enterprise, so progressive in this section, is for the time being fairly ruined. What is of equal consequence is the effect the disaster will have on the Donoughmore contract. The hopes of the bondholders were mainly centered on this line, which promised to be lucrative in earnings, and the sudden collapse of an indispensable adjunct will lead them probably to retire their proposal. No other means of com-

munication save that dilatory and costly one of mule and llama back exists with the interior, and even this to a small extent, owing to the withdrawal of such traffic by the facilities of the railway. The event is really regarded as a national calamity, and well may it be so."

Under date of April 4 the same correspondent writes: "Among the new theories started regarding the destruction of the Verrugas Viaduct is that it was suddenly overpowered by a lightning flash, and this is sustained by the sulphurous odor attached to all parts of the debris. Engineers are still busily engaged in their investigation, and the first reports of damages have resulted to be extremely exaggerated. Mr. Grace has signified his intention of furnishing the money required for the rebuilding of the structure, but it will require nearly a year before it can be completed. Meantime the vast mining interests in the interior are severely suffering, the ores being rendered stationary, and the articles of food brought down formerly to Lima have increased threefold in their prices. The market for goods from the coast is also ruined, and the evils resulting from the disaster are becoming greater every day."

Wire Nails vs. Cut Nails.

The *Wheeling Intelligencer* talks very plainly to the manufacturers of the Nail City, as follows:

The reason of the growing popularity of the wire nail has not been a secret. On the contrary, everybody has known that the explanation consisted largely in the fact that those who made them gave the consumers of nails from one-third to one-half more nails to the pound. Was this fact not something of great importance to cut-nail manufacturers? Should it not have been recognized ere this? The fact that it has not been recognized would seem to indicate to the public one of two things, either that cut nails cannot compete in this respect with wire nails, or else that the makers of them find it more profitable to go on selling the old-fashioned heavy nails. That they have not found it profitable to do so needs no proof at our hands. The declining price for nail stocks tells the story of itself. If, then, the cut nail could have been kept more popular with the public than it is to-day, but has not been so kept, it is plain that those who have been in charge of the vast interest embraced in their production are justly responsible to their stockholders for the present state of affairs.

The question arises as to what point the losing business of the past five years is going to be carried before stockholders will come to the front and take charge of their interests. Will it be when the stock of the majority of the mills quotes at 50 cents on the dollar? Some of them are nearing that point now. Or will a halt be called at the instance of those who have so much at stake and who recognize a necessity for two essential changes—viz.: first, to check the overproduction of a nail that does not meet the competition of the wire nail, and, next, to make a nail that promises to meet that competition with at least a greater degree of success than the present article?

The Chicago, Burlington and Quincy Railroad and competing line from Chicago have announced a new classification on iron, steel and rails from Chicago to St. Paul and Minneapolis. Commencing with Saturday, the 1st inst., these articles took sixth and fifth class rates on carloads and less. The rates now are, for car lots, 11 cents, less than car lots, 12½ cents, a reduction of 3 cents on the first and 4½ cents on the last named.

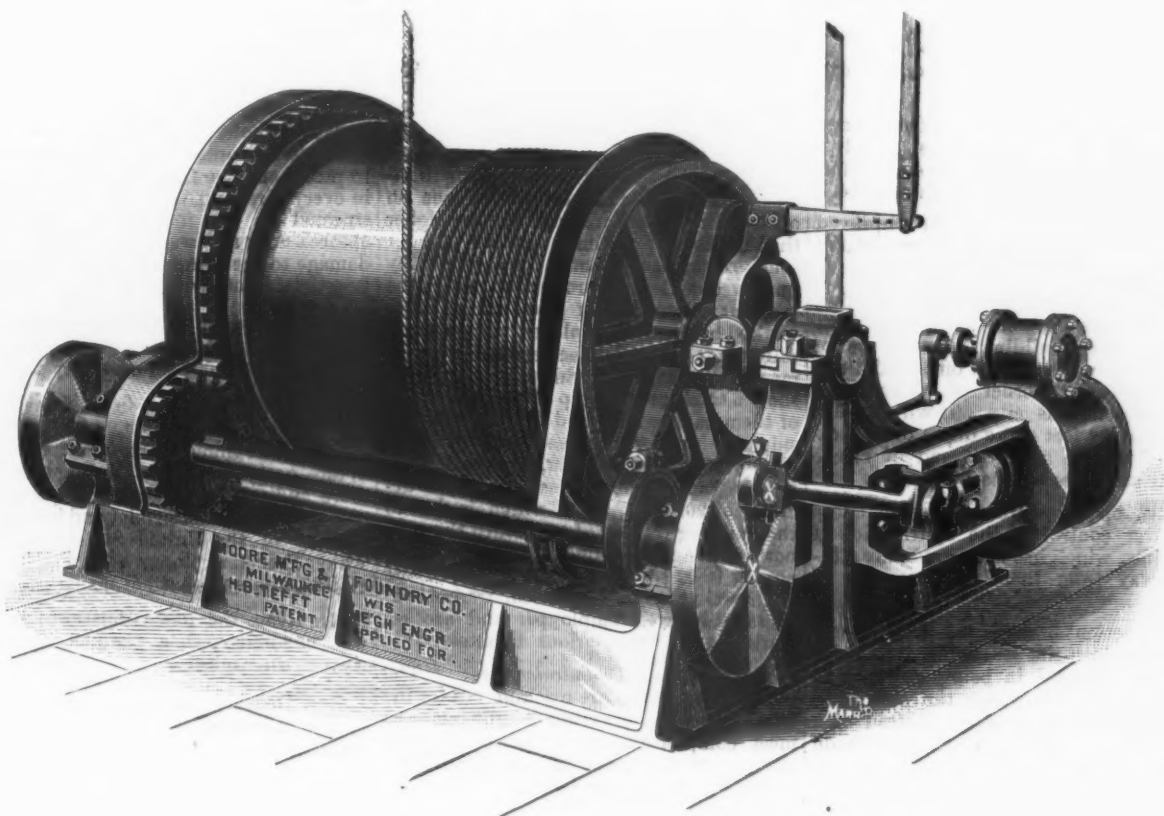
Hoisting-Engine.

The Tefft paper friction hoisting-engine, of which an engraving is here presented, is a new machine made by the Moore Mfg. and Foundry Company, of Milwaukee, Wis., and especially adapted for coal and ore hoisting, pile-driving, mining, &c. The form of the engine and the method of gearing and mounting the machine are plainly shown in the cut. By a simple movement of the friction-lever the speed can be regulated and the load raised steadily and uniformly at any desired speed, from nothing up to the limit at which the machine may be running. By the use of the brake-lever and the mechanism it controls the load can be held at any point. The engines are made with double $8\frac{1}{2} \times 10$ or $6\frac{1}{2} \times 10$ inch cylinders, set to quarter-stroke, with rocker-valves and straight-line frames. The

and the Mississippi River, except St. Paul and Minneapolis.

The new rail and lake rates to St. Paul and Minneapolis will be 17 and 21 $\frac{1}{2}$ cents, a reduction of about 5 cents on the all-rail rate. The inside history of this big iron and steel cut is quite interesting. The immediate cause of the present reduction was the cut made a few days ago by the Nypano from Youngstown to Chicago, and of course the other lines had to follow suit. The Nypano reduced the rate on manufactured articles of iron and steel from Youngstown to Chicago from 13 and 15 cents to 10 and 13 cents. Heavy pressure had been brought to bear on the Nypano and Lake Shore roads for some time by the Mahoning and Shenango iron manufacturers for a reduction of rates. The Nypano is not in the Central Traffic Association, but usually acts with that organization. About a month ago the val-

Our Shipping Interests.—Hon. Nelson Dingley, of Maine, the recognized leader of shipping legislation in Congress for several years past, has written an article for one of our popular reviews disclosing the policy that will be strongly urged for acceptance during the coming session. The measures to which Mr. Dingley gives his unreserved approval may be outlined as follows: The Government should begin by encouraging the enlargement of old ship-yards and the establishment of new ones on the Atlantic, Pacific and Gulf coasts and on the great lakes. The Government should pay a liberal construction bounty to encourage the building of iron and steel steamships for the foreign trade, on the theory that they may be available for naval service in case of war. The Government should pay liberal mail subsidies for faster and more frequent trips of existing lines, and the establishment of



THE TEFFT PAPER FRICTION HOISTING-ENGINE.

drums, without the engines, can be operated by belt or rope or by placing the pinion directly on a line shaft.

Cut In Western Freight Rates.

One of the biggest cuts in west-bound rates on articles of iron and steel manufacture in the history of railroads is reported to have been made by freight agents at Pittsburgh on the 1st inst. Only once before, about eight years ago, when the iron rate to Chicago for a few days was 12 $\frac{1}{2}$ cents, were the rates ever as low as they will be on June 8, when this latest cut will go into effect.

The present rates on iron and steel articles from Pittsburgh to Chicago are 17 $\frac{1}{2}$ and 15 cents in less than car and carloads respectively. The new rates will be 14 and 11 cents. The rates to East St. Louis will be 17 and 13 $\frac{1}{2}$ cents, 16 and 13 cents to Milwaukee, 24 $\frac{1}{2}$ and 19 $\frac{1}{2}$ to the Mississippi River points, Burlington, Rock Island and Davenport; 10 and 8 cents to Buffalo, &c. The cut applies west-bound to all the points between the Pittsburgh territory

and the Mississippi River, except St. Paul and Minneapolis. The new rail and lake rates to St. Paul and Minneapolis will be 17 and 21 $\frac{1}{2}$ cents, a reduction of about 5 cents on the all-rail rate. The inside history of this big iron and steel cut is quite interesting. The immediate cause of the present reduction was the cut made a few days ago by the Nypano from Youngstown to Chicago, and of course the other lines had to follow suit. The Nypano reduced the rate on manufactured articles of iron and steel from Youngstown to Chicago from 13 and 15 cents to 10 and 13 cents. Heavy pressure had been brought to bear on the Nypano and Lake Shore roads for some time by the Mahoning and Shenango iron manufacturers for a reduction of rates. The Nypano is not in the Central Traffic Association, but usually acts with that organization. About a month ago the val-

ley roads in the Central Traffic Association recommended to that body that a reduction be made, but the other lines refused and the matter was dropped. Afterward the Nypano, acting on its own responsibility, made the cut, which has become general.

The railroad men will not admit that the appeals and vigorous protests of Mr. Carnegie had anything to do with bringing about the reduction. They attribute the glory to the Mahoning and Shenango valley iron men, who induced the Nypano to make the cut.

This cut was wholly unanticipated in many quarters, the most prominent railroad men of the West having until very recently insisted that no reduction of rates would be made.

Another reduction in freight rates from Pittsburgh to El Paso, Texas, was made on the 1st inst. The reduction amounts to from 8 to 15 per cent., and the new figures are as follows: First class, \$2.23; second, \$1.96; third, \$1.73; fourth, \$1.53; fifth, \$1.25; class A, \$1.33; B, \$1.20; C, \$1.02; D, 80 cents; E, 70 cents per 100 pounds.

new lines specially to Central and South America and the East. The Government should adopt the French bounty system and establish a scale of navigation bounties, to be paid through a series of years to vessels engaged in the foreign trade, these bounties being large enough to cover the computed difference in running expenses between American vessels and the foreign vessels with which they must compete.

Operations will begin within the next ten days on a new Pittsburgh natural gas line that will be to some extent a competitor of the Philadelphia lines. It is to be built by the Oliver Iron and Steel Company and the Republic Iron Works. It will extend from Belle Vernon, a distance of 22 miles, and is to be a 16-inch main. The contract for the wrought-iron pipe has been let to the National Tube Works and will cost about \$12,000 a mile. The cost of laying it will be \$5000 a mile, making the total cost of constructing the line about \$500,000. The territory it taps is one of the richest in Western Pennsylvania and the builders of the line own large leases.

THE WEEK.

Dispatches from Oklahoma report the finding of rich iron mines a short distance from Guthrie. A shaft will be sunk at once and a thorough examination of the deposit made.

A New Zealand letter says the present year is a phenomenal one, both in respect to Australia's famine and New Zealand's plenty. A recently published official statement shows that the yield of wheat to the acre in New South Wales this year is $15\frac{1}{2}$ bushels; that of New Zealand is nearly 30 bushels. The total yield of New South Wales is about 1,500,000 bushels, a deficiency of some 3,750,000 bushels on the average of the last 27 years. As the requirements of the colony are over 8,000,000 bushels, and as Victoria, South Australia and Queensland cannot more than supply their own needs—and probably not that—the immense deficit of New South Wales must be made up by New Zealand. This the colony can easily do.

The Navy Department has determined to equip each of our naval vessels with a complete diving apparatus, thus profiting from experience in the Samoa hurricane.

Philadelphia harbor will be improved at a cost of \$200,000, already appropriated by the State.

Plans have been filed in the Building Bureau for the Farmers' Loan and Trust Company's new building. It will be an eight-story limestone-front office building, on the northeast corner of William and Beaver streets, this city. It will have a frontage of 92 feet and a depth of 70 feet. The roof will be fire-proof and of brick, and the structure will cost \$425,000.

English operators are making an effort to recover control of the distribution of China teas, which has been gradually slipping away from them for a number of years.

In the action brought by R. L. Montgomery against the steamship Port Adelaide, for damages in being required to bring the teas with which the steamship was loaded from a Brooklyn instead of a New York pier, where the Port Adelaide should have discharged, Judge Browne, in the United States District Court for New York, on Friday, decided that where a vessel departs from the usual custom in discharging her cargo the owners must be compensated for the additional cost of cartage.

Secretary Windom has rejected the site for new Appraisers' stores in New York selected by Secretary Fairchild, and is now considering the desirability of other sites. The appropriation available is \$800,000.

Architectural plans for the new World building on file in this city contemplate the erection of a structure 13 stories high, the materials to be brick, stone and terracotta. The ground dimensions are 115 x 136 feet, and the cost will be \$1,000,000. From the street level to the roof will be 188 feet.

A new steel cross-tail has been received at the Brooklyn Navy Yard for the steel cruiser Atlanta. On the return of the cruiser from her recent cruise in the West Indies it was found that the cross-tail in place was severely ruptured, there being no less than five cracks, one of which was fully 5 inches in length.

Tons and tons of honey are produced in California, and the export trade in this article is constantly extending. The California Fruit Grower says that from the 50,000 or 60,000 stands or hives in California for the year 1888 there was mar-

keted of extracted honey 3,000,000 pounds and of comb honey 500,000 pounds, or a total of 3,500,000 pounds for the season. The shipments to Europe have increased. They amounted to nearly 1,000,000 pounds of last year's crop. The greater portion of these shipments went direct to England; the balance to Germany.

The British steamship Hawkhurst, with a general cargo, steamed 2300 miles during 11 days on a voyage from London to Rio, with a fire raging in the hold and the decks red-hot.

Notice has been given by the Post-office Department that the rate of postage applicable in Canada to letters addressed for delivery in Canada or the United States has been reduced to 3 cents for each ounce or fraction of an ounce.

The flour-mill syndicate talked about for some time past, to embrace the principal mills in Minneapolis, is pronounced impracticable.

A memorandum of the industrial conditions of England has been prepared for the London Board of Trade from the reports of numerous trade societies, and the inference is drawn, comparing one with another, that the tide of trade is nearing high-water mark. The proportions of men on out-of-work benefit are yet somewhat higher than in the best of times, but this may to some extent be accounted for not only by improved methods of production, but by the very large amount of extra time being worked by the men employed, which naturally tends to restrict the demand for workmen. Those societies which have reported show a total membership of 192,973, many of them having increased in strength considerably during the past year. Of this total 3798 are out of work, as against 4000 for the same societies last month, a decrease of 202 only, all of which is due to the building trades. Last month the proportion per cent. of unemployed was 2.17, now it is 2, so that the change is of the slightest. The iron and coal trades continue to be well employed, and are remarkably free from serious disputes.

The Cleveland Plaindealer says: "The railroad companies are reaching out for the iron business by lowering freight rates to meet competition among manufacturers, but as yet Cleveland has received little benefit from the reduction. The New York, Pennsylvania and Ohio Railroad have posted a tariff on manufactured-iron articles and pig-iron from points in the Mahoning and Shenango valleys, which will be a reduction of 20 per cent. on the present rates. The new rates will go into effect May 30, and will affect west-bound business. The rates will hold good until August 31, after which the tariff now in effect will be reinstated."

To abate the rabbit nuisance in New Zealand a ferret-breeding establishment is maintained on one of the estates which will let loose 800 ferrets; 400,000 skins a year were sent to market from the station, and although the rabbits are now pretty well under control, over \$3000 a year is still expended in their destruction.

As the elevated tracks of the Pennsylvania road in Jersey City push their way toward the depot many inquiries are made as to how the work can be completed while more than 200 passenger trains and dozens of freight trains are run daily over the same ground. There will be three rows of iron columns to support the girders along which the four elevated tracks are to run. One of these rows of columns will be between the present surface tracks and the other two rows on the outside. The inside row and one of the outside rows for probably the whole length will first be built, and the superstructure will be completed with two tracks above. This

will permit the use of these two elevated tracks and the one directly beneath them, so that the third row of columns and the superstructure of the second half can be erected without interruption from travel over the second surface track.

It is stated by a prominent brewer that 11 of the 72 breweries in New York and vicinity have fallen into the hands of an English syndicate, who have a capital of \$7,000,000 and will issue bonds in London. In one instance a brewery that was paying 5 per cent. on an invested capital of \$500,000 was bought for \$600,000, and the syndicate propose to bond it for \$800,000 and guarantee 15 per cent. on this amount. A number of American brewers have consolidated their interests in opposition.

A serious explosion took place last week at the New Jersey Extraction Works, Elizabethport, in which one man was fatally and three others severely injured. The disaster was caused by the bursting of a new furnace filled with molten copper. Owing to its being a holiday only a few men were employed around the furnace. Usually there are 20 men kept working about the furnace drawing off the melted copper. The furnace was blown to pieces and the fragments were scattered in every direction. The furnace was constructed at the foundry of Samuel L. Moore's Sons and was recently built. The damage to the company by the explosion is estimated at \$6000.

King Kalakaua, of the Sandwich Islands, will visit the Paris Exposition if he can borrow the \$10,000 for necessary expenses.

Ex-Minister McLane, in his farewell letter to President Carnot, of France, referred to the immense region of the great West—a region which is tending to become more and more the center of population and industrial, commercial and intellectual activity of the United States; a region which French explorers helped to open to civilization, and that not many years ago.

Mr. Ryan, the new Minister to Mexico, was honored with a banquet on his arrival at the capital.

New Decatur, Ala., was the scene of a grand industrial celebration last week, which continued two days. Visitors were taken in steamboats to the Government works at Mussel Shoals, on which nearly \$5,000,000 have been expended, with the object of opening navigation from Knoxville, Tenn., by way of Chattanooga and Decatur to the Ohio and Mississippi rivers, thus benefiting the immense iron, coal, timber and agricultural interests of 56,000 square miles of territory, embracing the Tennessee Valley and its tributaries.

Charles Preston, secretary of the Haytian Legation, claims to have received cablegrams that Legitime still holds Port au Prince, but the weight of evidence goes to show that Hyppolite, of the Northern party, is the victor, and New York merchants are expecting more active trade, especially in coffee, of which it is said large quantities are awaiting shipment. It is stated in Washington that the demand of the United States respecting the maintenance of a coaling station in Hayti will be conceded without dispute. Hence no necessity for appointing a commission. Admiral Gherardi, just returned from Port au Prince, confirms the reported successes of Hyppolite, the rebel chief.

New South Wales has renewed the contract with the Oceanic Steamship Company for one year to carry the Australian mails which the Canadian line of steamships was seeking to obtain.

Secretary Noble has approved the plan of operations for continuing the irrigation

survey of arid lands proposed by Major J. W. Powell, director of the Geological Survey.

A large force of expert bridge-builders started from this city for Johnstown.

The building of the Jersey approach to the big bridge of the Baltimore and Ohio Railroad over the Kills is progressing rapidly. It will be completed by August 1. The approach begins at Roselle, and when finished will be six miles long.

The British Government has ordered a fleet of three vessels to Behring Sea pending the question of jurisdiction of the United States respecting the Alaska seal fisheries.

Fires in cotton cargoes from the United States are more frequent, despite the precautionary measures adopted by the boards of trade and other organizations. The narrow escape of the *Rugia* and a case of spontaneous combustion on the *Servia* at Liverpool are the latest examples. The difficulty is attributed to negligence in loading.

Chief Engineer Walter Katte, of the New York Central, says Italian railroad laborers haven't driven out Americans by working for less, because wages are higher than they were several years ago. The Italians get about \$1.20 to \$1.30 a day for ordinary work.

The graduating class at Cooper Union this year is larger than ever before. The number of students attending the different branches of the school is 3521, of which 3127 are men in the night school. The prizes from Wilson G. Hunt comprise one of \$15 in gold for mechanical drawing to Albert D. Mead.

The proposed enlargement of the State House in Boston will cost \$2,500,000.

Berlin cable dispatches announce that the Samoan treaty has been agreed to and the text forwarded to Washington for confirmation. It is claimed that the United States' view of the case has been very generally adopted, and our commissioners are more than satisfied with the result.

The Southern development of coal lands is having the effect to diminish materially the river trade below Pittsburgh, and it is intimated that the Southern market may be lost entirely.

Samuel D. Cock, owner of a large foundry in Callao, died in that port on March 24. All the leading papers of Lima and Callao paid feeling tributes on the occasion of the decease of this gentleman, who was one of the oldest members of the British community in Peru.

Salamanca, the new Captain-General of Cuba, has been enthusiastically received.

It is stated that the Omaha Railroad Company have completed an arrangement with the Oregon Railway and Navigation Company to connect the two lines, making a new transcontinental route.

The estimate for expenses of the New York Fire Department for next year is \$1,089,000, including \$270,250 for new buildings and equipments.

The statement that a dozen steel steamers for the lakes are to be built soon is discredited by the Pennsylvania Railroad Company, who were said to be one of the parties interested. A large addition to the lake fleets would not be warranted by the present state of business. A Buffalo paper says the same mammoth steel steamer line makes its appearance once a year and then drops as suddenly as if struck with a club.

The Legislature of Texas has passed a law making it a criminal offense for the freight agents of lines doing business in that State to meet for the purpose of mak-

ing rates. The law makes such an act conspiracy, and imposes a term in the penitentiary of ten years upon conviction. It also prescribes that rates may be lowered, but in no case may they be advanced. If competing roads should, in a rate war, reduce freight rates to a ruinous minimum, that minimum must be thereafter observed, and any attempt to advance rates by agreement will make the agents amenable to punishment under the conspiracy law.

Applications for 26 town sites in Oklahoma are on record.

The new iron rates on the Pittsburgh and Lake Erie Railroad go into effect June 17. They will apply on stuff from Wampum, Youngstown and other valley stations to the points in the vicinity of Scottdale. The new rates are as follows: On muck, scrap iron, billets, blooms and skelp iron 24,000 pounds minimum carloads, \$1.30 per gross ton; pig-iron, \$1.15; cinder and scale, \$1.10.

The tank system of making window glass, which has been so successful in Belgium, is being tried in Pittsburgh with good results. The tank used there by the T. Campbell Company is said to be the largest in the world, measuring 120 feet in length and 20 feet in width. It has a capacity of 760 tons of molten glass. Forty-eight men, blowers and gatherers, are at work at the same time and the weekly production of the tank is expected to be 6912 50-foot boxes of glass. The glass is declared to be without a blemish.

Fraudulent Bills of Lading.

The United States Supreme Court has just rendered a decision of much interest to the commercial world on fraudulent bills of lading.

Easton, the agent of the Texas and Pacific Railway Company at Sherman station, gave to Joseph Lahnstein a regularly drawn and signed bill of lading for 200 bales of cotton. Lahnstein indorsed the bill, drew a draft for \$8000 on Friedlander & Co., of New Orleans, and sent the two to that firm, who paid the draft.

It was subsequently learned that no cotton had been delivered to the road, that the bill of lading was fraudulent and that Easton and Lahnstein had acted in collusion. Friedlander & Co. sued the railroad company. They claimed that as the bill of lading was in regular form and issued by the company's agent, the company were liable.

The Supreme Court decides that the company were not liable. Here is what Chief Justice Fuller says:

"The company not only did not authorize Easton to sign fictitious bills of lading, but they did not assume authority themselves to issue such documents, except upon the delivery of the merchandise. Easton was not the company's agent in the transaction, for there was nothing upon which the agency could act. Railroad companies are not dealers in bills of exchange, nor in bills of lading; they are carriers only, and held to rigid responsibility as such.

"Easton, disregarding the object for which he was employed and not intending by his act to execute it, but wholly for a purpose of his own and of Lahnstein, became *particeps criminis* with the latter in the commission of the fraud upon Friedlander & Co., and it would be going too far to hold the company under such circumstances estopped from denying that they had clothed this agent with apparent authority to do an act so utterly outside the scope of his employment and of their own business. The defendant cannot be held on contract in the absence of goods, shipment and shipper; nor is the action maintainable on the ground of tort."

MANUFACTURING.

Iron and Steel.

Work on the new furnace of the Carrie Furnace Company, at Rankin, Pa., is being prosecuted vigorously, and it may possibly be ready for blast during the present month. It is being fitted up with Massicks & Crooke's hot-blast stoves, of which McClure & Schuler, of Pittsburgh, are the sole agents in this country. The furnace when completed will have a capacity of about 200 tons per day.

Warwick Furnace, at Pottstown, Pa., was successfully blown out on May 28, after a blast of 180 weeks, during which the furnace produced 107,600 tons.

A preliminary meeting of the manufacturers of steel shafts was held at the Hotel Anderson, Pittsburgh, last week, for the purpose of forming an association for mutual protection. Only three manufacturers were present, but matters pertaining to the trade were discussed. Another meeting will be held at an early date, when a large attendance is expected.

Charlotte Furnace, at Rochester, N. Y., made its largest output for one month in May, when an average product of 56 tons a day was attained of No. 1 and No. 2 foundry. The furnace is now making over 60 tons a day, mostly of No. 1.

Work on the new rod mill now in course of erection by the New Castle Steel Company, at New Castle, Pa., is progressing in a satisfactory manner, and it is expected to be ready for operation not later than September next. The plant will have a capacity of about 150 tons of rods per day, 100 tons of which will be used by the New Castle Wire Nail Company, of that place, while the balance will be sold in the open market. Employment will be given to about 100 men.

Walton Furnace, at Max Meadows, Va., the property of the Lobdell Car Wheel Company, of Wilmington, Del., has just been blown in.

Mt. Laurel Furnace, Clymer Iron Company, Temple, Pa., was banked on the 16th ult., in order to make necessary repairs.

For the week ending on Saturday, the 25th ult., Neshannock Furnace of the Crawford Iron and Steel Company, at New Castle, Pa., turned out 1411 gross tons of pig-iron. This is the largest production for the same length of time in the history of the furnace.

Gaylord Furnace, at Detroit, is out for general repairs.

We are informed that the report that the Moorehead-McCleane Company, of Pittsburgh, had notified their employees of a 10 per cent. reduction in wages is without foundation. The firm will wait until the Amalgamated Association presents its scale for the coming year before declaring their intentions.

Joanna Furnace, in Berks County, Pa., has started up after over two years' idleness. The furnace has undergone extensive repairs, enlarging its capacity, with new engines and boilers, making it one of the finest charcoal furnaces in the State.

After a successful run of nearly four years, No. 11 furnace of the Thomas Iron Company, at Saucon, Pa., will blow out the present week to make repairs.

Carnegie, Phipps & Company, Limited, of Pittsburgh, have extended the limit of time for the signing of the agreement at their Homestead Steel Works until the 10th inst. The original intention of the firm was to give their employees until 12 o'clock noon, June 1, to sign the new

sliding scale. If any of them did not do so by that time, their positions would be declared vacant.

The Glendon Iron Company, at Easton, Pa., are pushing forward repairs on stack No. 3. Their No. 2 stack, which has been in blast some time, is now out of service. This leaves but one furnace in blast.

The charcoal furnace of the Jefferson Furnace Company, at Oak Hill, Ohio, has been lighted.

Topton Furnace, of the Topton Furnace Company, at Topton, Pa., is undergoing extensive repairs at present, and will be ready for blast in a short time. At present the owners of the furnace are undecided whether to put it in blast when repairs are completed or allow it to remain idle until there is an improvement in the iron business.

The stack of the Vigo Iron Company, of Terre Haute, Ind., was blown out on May 22, and will probably be idle until fall. The stack will be raised 12 feet, and otherwise improved.

The Columbia Rolling Mill Company, of Jersey City, N. J., have bought a portion of their mill machinery, covering about 100 tons, to be delivered before June 15, and hope to have the balance, including boilers, engines, &c., in place before July 15.

The fact that the Valley Iron Works, of Coatesville, Pa., have resumed operations in full for the first time in three years, and that the Brandywine Iron Works and the Viaduct Mills, both of the same place, are now running in full force, would seem to indicate that the plate-iron industry of Eastern Pennsylvania is in a flourishing condition.

A contract for an important addition to their plate mills has just been given by Huston & Sons, of Coatesville, Pa. The new mill will be erected south of their present works, and will be made entirely of iron and fitted up with the most improved modern machinery. Several sets of rolls, 10 feet long and 36 inches in diameter, will be put in, and a large steam crane will be used for conveying the piles to and from the furnace. It is hoped to have the new plant in operation by January of next year.

Respecting the iron-works at Johnstown the Philadelphia Press of Wednesday says: "The news in reference to the situation of the Cambria Iron Company's affairs in Johnstown is much more favorable. It is said the company's furnace stacks were not even chilled, the gas and water-works are intact, and the Baltimore and Ohio tracks at Johnstown, which the company built, are not much damaged. The company have 1000 men at work clearing up the debris at one portion of the works, and will start up as soon as possible. The loss of the company has of course been very large, but it is not as heavy by any means as at first supposed."

Machinery.

The Atherton Machine Company, of Lowell, Mass., are employing an extra large force of men, and are turning out large orders for machinery to go to all parts of the United States.

Work has been commenced on new machines for the Clinton Wire Cloth Company, of Clinton, Mass., the increase in capacity being necessary to meet the demand for the "silver finish" brand of poultry netting made by this concern.

The various offices in the Westinghouse Building, at Pittsburgh, are kept cool by electricity. Nickolo Tesla, the inventor of the alternating current motor, has completed an adaptation of his motor to a fan, or to the revolving shaft of fans, for the production of cool air. The motors range

from $\frac{1}{2}$ to $\frac{1}{4}$ horse-power and are of the simplest construction, consisting only of a shaft revolving in an iron cylinder. There is no delicate machinery connected with the motor. After it has been attached to the electric current usually operating door-bells or lamps in private residences it will run forever, requiring only an occasional oiling of the bearings. The rapid rotation of the fan connected with the revolving shaft produces a current of cool air in the room.

The Laidlaw & Dunn Company, of Cincinnati, have received the contract for the entire pumping outfit to supply the United States barracks at Newport, Ky. This outfit is located at the new reservoirs of the Covington water-works. This concern is doing a large business in its standard Duplex pumps.

The Berlin Iron Bridge Company, of East Berlin, Conn., have closed a contract to build for the Franklin Moore Company, of Winsted, Conn., a new iron bridge, 40 x 100 feet, to be used as a forge shop. The building will be entirely of iron, without any wood-work about it, in order to insure absolute safety against fire. The same company are building for the Anaconda Smelting Works, of Anaconda, Montana, an iron building 325 feet wide by 600 feet long. This building is also entirely of iron, iron trusses covered with corrugated iron, and replaces the entire plant of the company which was lately destroyed by fire.

The Energy Mfg. Company, 1115 South Fifteenth street, Philadelphia, have within the last couple of months made shipments of their rope hoisting-machines, center-grinders, &c., to the following places: Australia, Alabama, Arkansas, California, Colorado, Connecticut, Dakota, Delaware, District of Columbia, Illinois, Indiana, Iowa, Maine, Massachusetts, Minnesota, Nebraska, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Vermont and Virginia. This list of localities to which shipments have been made gives an excellent view of the very wide scope of the trade enjoyed by this company.

The Westinghouse Electric Light Company, of Pittsburgh, have just secured a large contract in Sterling, Ill., for the erection of a plant of 750 arc lights. The whole costs \$15,000.

The Putnam Machine Company, of Fitchburg, Mass., have just presented an illustrated catalogue, which gives in brief the history of the Putnam Company, followed by handsome engravings showing the many lines of tools manufactured by them. These include lathes of all kinds, gear-cutting machines, slabbing or milling machines, drills, die, bolt and nut-tapping machines, planers, car-wheel borers, slotting and paring machines, reamers, taps, dies, drills, &c. The catalogue not only presents a perspective view of the many machines made, but in some instances also presents such sectional drawings as may be necessary in order that the reader may fully understand the construction and operation of the machine. A complete description is also given of the well-known Putnam automatic cut-off steam-engine.

The Jeffrey Mfg. Company, of Columbus, Ohio, report a steady demand for their elevating and conveying machinery. They are running their works full time, and the prospects for business in their line are good.

From John Adt & Son, of New Haven, Conn., we have received one of their new catalogues illustrating and describing their machinery for wire-workers and hardware manufacturers. This includes their wire straightening and cutting and

wire straightening machinery of various kinds and sizes, which are so well known. They also describe their automatic shear-point staple machines, elastic rotary-blow riveting-machines, butt-milling and butt-drilling machines, adjustable drilling and countersinking machines, and foot presses and double-head drilling and milling lathes. Some of these machines we have presented in former issues of *The Iron Age*.

Among the recent purchasers of the patent friction covering now being manufactured by the National Pulley Covering Company, of Baltimore, are the following: Owosso Tool Company, Owosso, Mich.; H. P. Duschler Company, Hamilton, Ohio; Merrimac Mfg. Company, Scranton, Pa.; Norfolk Knitting Mills, Norfolk, Va.; Coonell Mfg. Company, Ann Arbor, Mich.; Wardnell Needle Works, Lake Village, N. H.; R. C. Dunn & Bro., Goldsboro, Pa.; Lindsey Bros., Middletown, N. Y.; W. S. Conger, Litchfield, Mich. Their business in one week recently came from 15 widely-separated States.

From Nicholson & Waterman, of Providence, R. I., the well-known makers of a full line of nut machinery, we have received a valuable treatise on stay bolts, which opens with a description of the duty to be performed by a stay-bolt, and then considers the methods now practiced of securing the bolts. The pamphlet treats the subject solely in a practical way, points out the difficulties encountered, and suggests the remedy.

Miscellaneous.

The Berlin Iron Bridge Company, of East Berlin, Conn., have just issued a large catalogue in which they illustrate their line of work by means of engravings made directly from photographs of actual structures built by them. The views presented have been so selected as to convey a very clear idea of the types of iron railroad and highway bridges built by them; also their method of building cylinder piers with piles and concrete. Following this is an extended description, copiously illustrated from work actually done, of their various forms of iron roofs for factories, depots and other buildings in which the span is considerable. These cover cases varying in magnitude from the grand iron train sheds of the New York, New Haven and Hartford Railroad at New Haven down to platform coverings for depots. They also present a list of many large and well-known firms for whom they have erected iron buildings during the past few years. Following this are the various forms of angles, T-bars, channels, beams and girders; also iron doors and shutters. In the back part of the book is a long list of iron and highway bridges built by the Berlin Company, and also a large collection of testimonials which commend the durability, simplicity and strength of their bridges.

In a recent issue of the *North American Review* Prof. R. H. Thurston, of Cornell University, and an authority on the subject of steam-engines, expresses it as his opinion that this invention is capable of vast improvement, and that it has not yet begun to exhaust its inherent powers. On the basis of greater developments in the application of inventions to the steam-engine Professor Thurston predicts that the next generation will see it consuming 1 pound of fuel per hour for a single horse power; that ships of 20,000 tons will be driven at the rate of 40 miles per hour; that the American continent can be spanned by flying trains in two days and that transportation between the cities of the Atlantic and those of the Pacific coasts will be so cheap that the general average of living will be vastly improved upon what exists to-day.

The Iron Age

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The Appalling Calamity at Johnstown.

The columns of the daily newspapers are filled with details of the terrible catastrophe which befell Johnstown, Pa., on the night of last Friday. What was then one of the most flourishing of the inland cities of Pennsylvania, with 30,000 people in its natural boundaries, is now a storm-swept waste, with a few ruined buildings and but a part of its former population of busy workers. Its industries have been almost annihilated, its people have been reduced from comfortable circumstances to abject want, and its future has been suddenly transformed from one of brightest possibilities to one of doubt and darkness. The records of a century show nothing on this continent at all approaching the Johnstown horror in loss of life. Its suddenness was also a peculiar element, adding terror to the occasion. One rush of the fatal flood, a short season of swirling waters and crashing buildings, and the destroyer had done his work. The various forms of pestilence which have at times devastated portions of the country have given their victims warning of their approach, and even such earthquakes as have visited us have been merciful in their death-dealing power as compared with this latest frightful example of the destructiveness of the forces of nature. The annihilation of at least one-fifth of the total population of the valley in a time which could be measured by minutes is an awful occurrence, passing our powers of comprehension.

It appears from the best accounts of the catastrophe at hand that there were three stages in the disaster. First came a flood in the two streams which unite at Johnstown, caused by a heavy rain of some two days' duration; the second was the breaking of a lumber boom on Stony Creek, which sent a large number of logs crashing through that part of the town overflowed by its waters, and the third, and the most calamitous of all, was the giving way of the dam at Conemaugh Lake, located ten miles above Johnstown on a branch of the Conemaugh River. When the lumber boom on Stony Creek was broken the enormous mass of logs, hurled down the stream and over the submerged district of the doomed city, tore away the houses as though they had been built of cards. While this work of destruction was still going on there came down the valley of the Conemaugh a towering mass of rushing water from the burst embankment at Conemaugh Lake, which swept with resistless force over the remaining houses and buried them under fathoms of water or carried them at once down the stream. Below the city is a stout stone bridge over the Conemaugh River, built quite recently by the Pennsylvania Railroad

Company. Against this the mass of *débris* became lodged; the waters were backed up and overflowed all the space where the streets of Johnstown had been. And then, as though horror was fated to be piled on horror, fire broke out in the *débris* and burned to death numbers of human beings who had been carried thither in their frame dwellings.

The great rain storm which was the immediate cause of this dreadful occurrence prevailed over a wide section of the country from New York to Virginia, washing out railroad bridges, sweeping away trestles, causing land-slides, breaking down telegraph wires and interrupting railroad travel and means of communication by wire for several days. Information from Johnstown which was at first received by the outside world was, therefore, meager, and the frightful calamity briefly narrated in the press dispatches was thought to be exaggerated. But, unlike almost every other disaster, the proportions of this one have grown larger with every hour bringing more complete details. Nothing has transpired to mitigate its unvarying tale of loss of life and the terrible experiences of the survivors except that occasionally some one at first reported dead proves to have been rescued.

Conemaugh Lake, which is above alluded to as having burst its bounds, was an artificial sheet of water held in place by a dam. It was about $3\frac{1}{2}$ miles long, 1 mile wide, and in some places 100 feet deep, and is said to have been the largest artificial reservoir in the United States. It was not constructed for useful purposes, but for pleasure, and is the property of a corporation called the South Fork Fishing and Hunting Club, composed principally of residents of Pittsburgh. Its outlet was from 200 to 300 feet above the level of Johnstown. The citizens of that place were aware of the danger to which they were exposed by the possible bursting of the dam, but rested quietly within the shadow of trouble from that source, confiding in the examinations known to be made from time to time by capable engineers, who regularly reported it staunch and able to withstand any force short of a convulsion of nature. It is presumed that the dam was weakened by the excessive rainfall and strained by the unwonted accumulation of water in the lake, and that a sudden cloud-burst supplied the conditions favorable to its collapse, which was attended with such sorrowful results. Criticism, denunciation and fiery words of reproach are being freely used against the unwitting authors of the destruction of Johnstown, and it is possible that the responsibility of the members of the club may be tested by suits at law. But no reparation is now possible, from this or any other source, that will mitigate the sorrows of those who mourn their loved ones.

The measures of relief for the sufferers by the floods are on a scale corresponding with the extent of the disaster. New York City immediately responds with large sums. The New York Chamber of Commerce on Tuesday held a special meeting. Like movements were initiated by all the exchanges and other commercial bodies. The Connecticut Legislature appropriated \$25,000 for the flood sufferers, and the Massachusetts Legislature \$10,000. The Bethlehem (Pa.) Iron Com-

pany have directed the Johnstown authorities to draw upon the company for \$5000. Immense quantities of relief stores are being sent to Johnstown from Pittsburgh, Philadelphia and other points, transportation free. Latest advices from the scene of the disaster do not mitigate its horrors or its extent.

Mercantile Opportunities in Japan.

Japan is now recognized as the leading nation of the Orient, although only 25 years have elapsed since she entered the field of modern progress. When the Tycoon was dethroned and the Tokugawa dynasty became extinct after a continuous reign of 300 years, there was scarcely a foreigner in the country outside of the treaty ports—the legation buildings at Yeddo being closed on account of the enforced withdrawal of the resident ministers. Christianity was prohibited by an edict posted everywhere on the public thoroughfares, and the entire population remained in a condition of Eden-like simplicity as regards raiment and other domestic requirements such as call for the products of industry and ultimately create a market for articles of foreign manufacture. To-day we find Japan the very foremost of Asiatic nations, whose commerce is expanding by "leaps and bounds," so that, as we are told on good authority, "instead of being only one-seventh of China's commerce, as it was ten years ago, it is already one-half, and will in all probability be equal to or greater than that commerce a few years hence." In all that constitutes national greatness—in her system of government, her naval and mercantile marine, railroads, telegraphs, water-works, shops and manufactories—Japan is advancing with amazing strides.

At the present juncture the question is pertinent whether the United States Government, or rather the mercantile representatives of that Government, are hastening with due alacrity to take advantage of the special privileges and prerogatives acquired under the treaty with Japan in February last. It will be remembered that at that time, after protracted but unavailing endeavors on the part of the great powers acting in unison to effect a treaty revision, Japan approached each of them separately. The negotiations of 1886-87 were effective only in convincing Japanese diplomatists that to reconcile the conflicting interests and prejudices of seventeen powers was impossible, except at the price of abject humiliation. Thereupon it was determined, by a masterly stroke of policy, to remove the "stigma of international isolation," and almost simultaneously with the promulgation of a constitution on February 11, attended with an exuberance of national feeling rarely manifested on any occasion, Japan's overtures to the United States were promptly accepted, and as a consequence Americans will soon, before the end of 1889, be in the full enjoyment of freedom to trade, travel, reside or own property anywhere within the limits of the Empire, but on the condition of fully recognizing Japanese jurisdiction, as in any other independent nationality.

Meanwhile it is interesting to observe the attitude of the European Powers, to whom proposals similar in terms were like

wise submitted. The London *Times*, admonished by its correspondent at Tokio, who presents the subject in much fullness, is inclined to reproach the imperial authorities for their indifference, lest through their inaction the position now occupied by England in Japan and the share she now enjoys in her foreign commerce be taken "by some other power, such as the United States, which is more sensible of the commercial substance. Either we must accept the terms offered to and accepted by the United States," says the editor, "or we must yield the command of the Japanese markets to our principal commercial rivals in Japan." The question again arises: Are merchants in the United States availing themselves of their opportunities? A communication from the Minister of Foreign Affairs or Department of State setting forth the present position of affairs and the advantages incidental to the situation would be well received.

American Ocean Steam Traffic.

The annual report of the Pacific Mail Steamship Company states that the new 5000-ton steel steamship contracted for in Glasgow will be built at a "saving of one-third in cost over the prices quoted by the ship-builders on this side of the Atlantic." She is, however, debarred from carrying the American flag, and likewise excluded from the American coastwise trade. Neither is she eligible for mail pay from the United States beyond sea postage. "But the policy so far displayed by our Government," says the report, "has not warranted the managers in supplying their needs in the United States at such a material difference in cost." The action of the Pacific Mail Company in placing this contract in Europe was not graciously received by builders in the United States. Nor is it likely that these builders will concede that they are handicapped to the extent of one-third, if due allowance is made for the superior materials and workmanship required under the American standard. The report intimates that under a more liberal policy—doubtless meaning more liberally in the matter of mail contracts, or a bounty system of some kind—it will be "an easy matter for the company to qualify therefor by providing additional American tonnage."

Incidental to this subject a report comes from Washington that President Harrison and members of the Cabinet will soon have a prolonged conference with the officers of the Brazil Mail Steamship Company, with reference to the alleged discrimination against the American ocean marine, under the present maritime laws of this country. H. K. Thurber, the president of the company, is understood to have prepared documents, at the request of the authorities in Washington, showing the hardships now experienced by American companies in the unequal struggle with the subsidized lines of Europe. In the case of the Pacific Mail Line the company, aside from ordinary disabilities, have suffered from the operations of the Chinese restriction act and from the suspension of work on the Panama Canal, as well as from the competition of the subsidized steamships of the Canadian Pacific Company plying between Vancouver and Asiatic ports.

American ship-builders are said to be much elated at the prospect of a conference with the new Administration, hoping that it will be the inauguration of a policy looking especially to the relief of the interests of the ocean carrying trade, and in behalf of which all measures thus far attempted, either by the National or State governments, seem to have been wholly ineffectual and nugatory.

The Buffalo Railroad Complaint.

The New York State Board of Railroad Commissioners have rendered a decision in the complaint of the city of Buffalo. This complaint was founded on the fact that local rates between Buffalo and New York were a little more than the proportion of the through rates between the same points. In these days of severe competition a little difference like this in question prevents Buffalo from buying at the West to sell again at the East, or *vice versa*. It was claimed that the city was entitled to such a local rate as would permit this, and without ordering it so, the State Commissioners think that the claim is just. The decision does not go beyond suggestions, because the matter runs into interstate complications, and the Interstate Commission, in the somewhat similar complaint made by Detroit, took ground exactly opposite. Detroit, it will be remembered, asked for such a system of tariffs to and from the sea-board as would enable it to secure a share of the grain and jobbing trades of the States further away. But it was held that no city "owned" any trade whatever, and none was entitled by natural right to any lower tariffs founded merely on the desire to control trade, especially if such a plan would result in actually higher prices to the consumer.

In the Buffalo case the New York board anticipate the possible effect of granting *pro rata* rates to that city, and bluntly say that it would be right even if it resulted in higher through rates between the far West and the sea-board. Such a thing, however, is out of the question. The canal and the lakes, to say nothing of many other commercial conditions, must always force minimum through rates upon the rail carriers. It is beyond the power of the railroad managers to put what rates they may wish upon breadstuffs or manufactures, and the New York board must know it. Another and strong objection to any such increase of rates is the increased cost to the consumer or to the manufacturer; and when we consider that this proposed increase is to be put upon traffic in order that the middle-men of a particular city may do a larger business, it seems a wrong to the public even to advocate it. If once the principle be granted, it is only a question of time when all intermediate cities will demand the same jobbing privileges, and it would be very difficult to say why one should have it and not another. The end of such a state of things would be the practical breaking up of long routes of transportation at cheap rates, for every through rate would necessarily be no lower than the sum of a number of high locals. Any other system like the present must injure the middle-men's trade at some point or points between.

Buffalo has manifest advantages as a jobbing center. A large lake traffic out

and in makes it a natural distributing point, and its enterprising citizens have not been slow to use their opportunities. Coal, ore, breadstuffs and many products and manufactures are there transferred from water to rail or water. The city does not need other advantages for its prosperity. In concluding their decision the board say, speaking of *pro rata* rates for Buffalo: "Otherwise the result will be that the centers of business and distribution will be pushed further and further West, to the detriment and eventual paralysis of Eastern cities—a result which certainly will not be calmly tolerated." This opens up a wide subject. Do the commissioners mean that Buffalo is entitled to such a system of freights as to give it power to stop sea-board traffic and distribution in the trans-Missouri States? Undoubtedly a city should have reasonable tariffs, but where to draw the line in our complicated mercantile system is a problem yet unsolved.

China's Trade in Metals, Petroleum, &c.

Mr. E. McKean, the secretary for statistics of the Chinese maritime custom-houses, has just published his returns for 1888, as compared with those of former calendar years. They are more complete, and consequently more valuable, than they have been heretofore, particularly with reference to metals, about which the world at large has hitherto been but ill-informed, especially as regards tin and lead, now given in detail. The figures are given in Haikuan taels of \$1.24 American.

The import into China through the treaty ports was as follows:

	Taels.		Taels.
1883.....	73,567,702	1886.....	87,479,323
1884.....	72,760,758	1887.....	94,624,818
1885.....	88,200,018	1888.....	105,961,372
Total.....	234,528,478	Total.....	287,765,513
Increase.....	53,237,035, or 23 per cent.		
	Iron.	Tin.	Lead.
	Piculs.	Piculs.	Piculs.
1883.....	817,536	71,082	190,723
1884.....	843,582	51,447	103,104
1885.....	1,202,880	66,700	159,783
Totals.....	2,863,998	189,179	453,610
1886.....	1,083,371	50,823	215,867
1887.....	1,023,000	40,556	222,926
1888.....	1,208,408	77,225	220,767
Totals.....	3,404,839	169,604	659,560
Increase.....	540,851, or 18 %	Dec. 20,575, or 11 %	Inc. 205,950, or 45 %

Reduced to tons of 2240 pounds (1 picul equaling 134 pounds) the import in 1888 was:

	Tons.	Value.
		Taels.
Iron.....	77,000	2,185,286
Tin.....	4,600	2,135,721
Lead.....	13,670	1,005,271
Total.....		5,326,278
Other metals.....		1,560,845
Total.....		6,887,123

On the other hand, 15,000 piculs of tin were shipped through the ports of Pakhoi and Ichang in 1888, probably at the time when the French syndicate had raised prices to a point inducing re-exportation. The import of petroleum was as follows:

	Gallons.	Stock at Shanghai December 31.
		Gallons.
1885.....	14,000,000	1,250,000
1886.....	23,088,101	10,500,000
1887.....	12,015,135	5,500,000
1888.....	16,613,080	5,000,000

Since Russian refined has begun to compete with our petroleum in China there is a tendency to overstock the Chinese market, and henceforward this branch of the trade will be subject to extreme fluctuations in the supply and price.

The mills of British India are fast supplanting Manchester in the twist trade with China. Thus Shanghai in 1888 received 163,946 piculs of twist from British India and only 62,721 piculs from England. The general twist import into China developed as follows:

1878.	1880.	1882.	1884.	1886.	1888.
Piculs.	Piculs.	Piculs.	Piculs.	Piculs.	Piculs.
108,300	150,518	184,940	261,457	382,984	561,003

The amount of cotton piece goods imported into China in 1888 was 44,437,525 taels; in this trade the United States at times largely participates whenever the market out there chances not to be overstocked. Other imports in 1888 were: Fish, 2,637,132 taels; matches, 1,089,842; rice, 9,633,829. Match factories have been started on a large scale in China, the consumption of the article being enormous. The rice imported was 7,132,211 piculs; the famine, of course, stimulated the movement.

In 1888 China exported through the ports 92,401,067 taels' worth of products, against 85,860,208 taels in 1887. Her export of tea was as follows:

	1884.	1885.	1886.
	Piculs.	Piculs.	Piculs.
Black.....	1,564,451	1,618,409	1,654,058
Green.....	202,556	214,693	192,930
Brick.....	244,996	280,111	361,492
Totals.....	2,012,003	2,113,207	2,208,480
Taels.....	20,030,641	32,207,042	33,464,155

	1887.	1888.
	Piculs.	Piculs.
Black.....	1,629,880	1,542,209
Green.....	184,681	209,377
Brick.....	351,281	412,641
Totals.....	2,145,842	2,164,227
Taels.....	30,011,720	30,280,611

Russia receives the large amount of tea it imports from China overland via Kiachta. In the English market tea from British India rapidly supersedes Chinese, while of the tea consumed in the United States 50 per cent. is imported from China and the remainder from Japan.

China's silk export in 1885 was 20,001,175 taels; in 1886, 28,863,218; in 1887, 31,690,214; in 1888, 32,180,298. The export of Chinese straw mats declined from 150,942 piculs in 1887 to 79,938 in 1888. China exported in 1888 no less than 12,000 tons of paper, worth 1,650,298 taels. While China exported 60,000 tons of sugar, the import did not exceed 8680 tons; about 33 per cent. of the export went from Formosa to Japan.

American trade with China was as follows:

Calendar year.	Import into the United States.	Domestic export to China.
1888.....	\$17,557,841	\$3,196,055
1887.....	17,875,479	5,315,115

While our import from China is as a general thing steady, the domestic export, which is largely cotton goods and petroleum, naturally fluctuates widely where competition is so great.

A letter from Chattanooga extolling the advantages of that city as an industrial center says: "In less than a quarter of a century there has arisen, almost phoenix-like, a beautiful city, in the enjoyment of commercial power. Thirteen railroads radiate to all parts of the country; over 200 manufacturing establishments bring money into her coffers; a well-ordered street railway system, dummy lines and electric cars give local transportation facilities, while gas and electric lights, water-works, grand churches, good hotels, and everything that goes to make up a magnificent city are among the actual advantages which she enjoys. You could

find nowhere better appointed nor handsomer homes. There are besides a steel-rail mill, blast furnaces, wrought-iron pipe works, planing mills, iron and mantel concerns, an edge-tool factory, machine works, tack, nail and spike mills, a great forge, capacious brass and copper foundry, extensive tanneries, various wood-working establishments, a brick-yard turning out fine pressed brick, a stained and plain glass works, car and wheel shops, agricultural works, barbed-wire mills, carriage and wagon factories, and many more. All these are doing a good business."

Great Destruction of Bridges.

The destruction of bridges, lumber, dams and other property by floods within the last few days, notably in Pennsylvania and New York States, but extending south through Maryland and Virginia, will make a lamentable aggregate. The Pennsylvania Railroad alone have lost more than 20 bridges, many of them large and costly. A Harrisburg railroad official estimates the loss of the company at \$3,000,000. On the Pittsburgh division the bridges between Altoona and Johnstown are gone, also the Mineral Point bridge and the Conemaugh bridge, the bridges at Linden and Montgomery on the Erie division, and three spans of the bridge at Williamsport. The Philadelphia and Reading lose the bridges at Milton and Sunbury. On the West Pennsylvania division the bridges at Blairsville, East Tunnel and East Leechburg are gone. The destruction of property at Hanover, Pa., is enormous. The railroad bridge at Mengis Mills was swept away. The Long Bridge at Washington is badly wrecked. To repair the damage the Pennsylvania Railroad purchased 4,000,000 feet of heavy timber at the large lumber yards along the line, Wilmington and Baltimore lumber yards furnishing about 1,000,000 feet more. The Pennsylvania Canal at and above Columbia is greatly damaged and all the rolling-mills are submerged. In Virginia the floods were disastrous. The trestle bridge of the Norfolk and Western Railroad and that of the Richmond and Petersburg Railroad Company across the Appomattox River at Petersburg were washed away; also Campbell's Bridge, and a new and costly iron bridge on the Petersburg and Weldon Railroad. The Chesapeake and Ohio Canal is damaged to the extent of perhaps \$1,000,000 and virtually destroyed. Losses in the Cumberland Valley are estimated at \$200,000. Eight bridges between Sensheim, Pa., and Gunpowder Falls, Md., along the Western Maryland Railroad, have been carried away. In New York State the losses are heavy. The losses at Elmira are put down at \$500,000. The Erie Railroad shops at Hornellsville were flooded and abandoned. The New York, Lake Erie and Western's new iron bridge across the Genesee at Belmont was swept away. The monster iron tanks of the National Transit Company on the flats at Olean suffered severely. The destruction of the Delaware, Lackawanna and Western bridge at Waverly will suspend all through Western traffic for several days. The losses of lumber at Williamsport and Lockhaven, Pa., on the Kanawha River and at other points are estimated at millions of dollars.

The contractors for the new cruiser Baltimore have notified the Navy Department that the preliminary trial of the ship will take place on June 15 in the Delaware River. In the official trial the ship is to show a speed of 19 knots upon an estimated horse-power of 10,500. The total cost of the hull and machinery, exclusive of her armament, was \$1,325,000, and most of this money has been paid over to the contractors.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., June 4, 1889.

The Bureau of Ordnance officers are very well satisfied with the outlook for the fabrication of modern high-power and long-range guns. The Bethlehem Iron Company, under their contract with the Government, from their new plant are now prepared to furnish the largest forgings which will be required for the heaviest ordnance under present designs. The Government has already completed a number of 6-inch and is finishing the 10-inch guns. It is now proposed to order a supply of 12-inch caliber, after which the 16-inch guns, the largest designed by the Naval Ordnance Bureau, will be given a practical test in the way of manufacture. The Bethlehem Company are now turning out the largest steel forgings ever attempted in the United States.

The guns for the Charleston's batteries are on their way to San Francisco. It was stated at the Navy Department to-day that the facilities were now such that guns of the different calibers can be turned out as rapidly as they will be required by the vessels now under construction. Engineer-in-Chief Melville and his chief assistant, M. P. Towne, U. S. Navy, with the competent force under their direction in the Bureau of Steam Engineering of the Navy Department, have completed the designs for the engines of all the vessels under way and which exceed in power anything ever attempted in the United States. The engines for the 3000-ton cruisers are designed to develop 10,000 horse-power and to make a speed of 20 knots an hour. These engines have six boilers; one pair, 14 feet 4 inches, another pair, 13 feet 4 inches, in diameter, and all 20 feet 4 inches long, and two donkey boilers, 10 x 18½ feet. There are four cylinders, one for high, two for low pressure, and one intermediate, with piston-valves. There are brass condensers, each with centrifugal circulating pumps for condensing and also air pumps. Each system of boilers is supplied with separate feed pumps and other appliances, and can be worked separately. They will carry 160 pounds of steam. The officers have great confidence in these engines, which are now under construction. All the boilers and all practicable parts of the machinery are made of steel, the shafts being hollow. Each engine has auxiliary condensers, and can work separately and also operate the twin screws. The engines for the 2000-ton vessels are triple expansion, with 5400 horse-power. There are four boilers 18½ feet and a donkey boiler 9½ feet long, all of them being 12 feet in diameter.

There is unusual activity in all branches of the Navy Department preparing designs of the hulls, machinery and ordnance for the new vessels authorized by Congress. Chief Constructor Wilson, with a large corps of assistants, Engineer-in-Chief Melville, assisted by Chief Engineer Towne and Commodore Sicard, Chief of the Bureau of Ordnance, with experts in their respective branches, are pushing work with the utmost rapidity.

If Congress exhibits the liberality indicated by the Republican Senate a few years ago, the close of the present Administration will find the navy of the United States one of the fleetest and finest in the world.

The Philadelphia Record says engine No. 206 on the Bound Brook Railroad, built on the Wootton pattern, ran eight miles at the rate of 39 seconds per mile, or over 90 miles an hour.

A Model Electrical Manufactory.

An article in the *Stevens Indicator* for April, by L. W. Serrell, Jr., thus describes the new factory of the C. & C. Electric Motor Company, at 341 Greenwich street, New York City, employing over 100 men and depending upon electric power alone as a prime mover:

The building is a thoroughly fire-proof structure, built entirely of iron and stone. The floors are made of granolithic cement, with a slight slope draining to the center of the side walls to sewer connections, and may be washed down with a hose, or flooded in case of fire, with water taken from a 15,000-gallon tank on the roof. This tank also supplies the water necessary to operate the elevator, and receives its supply from an artesian well under the building. The walls are provided with conduits built in them for the electric wires. The electric-power generating plant is in the basement, and the only possible means of distributing power around the building is through the wires which run out of the dynamo-room. As the structure of the building does not allow of the running of belts from floor to floor, dependence is had entirely upon electricity as a motive power. The power-generating plant consists of a 12 x 12 inch Ball engine, belted direct to a No. 20 Edison dynamo, of 50,000 watts capacity, compound wound for 220 volts; the engine also drives through a counter-shaft a constant-potential and constant-current dynamo used in testing. A central station switch-board is arranged beyond the dynamo, from the "bus" wires on which are tapped independent circuits to each floor. At present four motors are employed, two of $8\frac{1}{2}$ horse-power, one of 2 horse-power and one of 1 horse-power; yet these small machines, fixed in out-of-the-way places, furnish power for 22 engine lathes, eight drill presses of various sizes, four milling-machines, two power presses, several iron planers, besides tapping-machines, grindstones, emery-wheels and a 60-inch boring-mill, making in all a total of about 45 machine tools.

Power tests made in the engine-room, when a full force of men is working in the shops, show a load of 22 horse-power on the engine and an electrical output of $13\frac{1}{2}$ horse-power on the dynamo. This may seem incredible, but when we remember that every time a machine is shut down the motor is instantly relieved of that amount of work and takes just so much less current, and the dynamo supplying less current takes less power to drive it, we can more readily see how such figures are not so improbable, after all, especially in cases where the shafting load is light. In actual practice probably not over half the machines are doing actual work at the same time; thus one man may be setting his work in position while the man at the tool next to him may have his machine in operation doing work. Hence in a carefully-laid-out shop, with short lengths of shafting making a light friction load, there may be installed machines requiring, if all were worked at precisely the same instant, nearly double the amount of power represented by the motors installed. This is analogous to the case of an electric-light station where the number of lamps placed on a circuit would require, if all were burning at precisely the same instant, more than double the amount of current that the generator feeding the circuit is capable of supplying.

A decided advantage is gained in this system of factory construction over the usual method of transmitting all the power by belting and long lines of shafting by being able to run any small portion of the factory independent of all the rest. For instance, if the work is behind in one department and it is necessary to work over-

time, that particular department of the shop, having a motor of its own, can be run without running any of the machinery or shafting in any other part of the building; and thus a great saving of fuel can be effected over the old method; where it would be necessary to run all the shafting throughout the entire building.

The building is wired for 220 lights, connected two in series, and each floor is provided with a separate switch-board, to which the terminals of the various light-circuits are brought. The circuits are so arranged that the darker portions of the shop may be lighted independently of the other portions. The building is heated with the exhaust steam from the engine, which exhausts into a 6-inch pipe that runs through the upper part of a large horizontal drum used as a feed-water heater, and thence up to the roof, where it exhausts into the air when not used for heating. The upper end of the exhaust-pipe is provided with a check-valve which opens when the back-pressure reaches a certain amount. Valves are provided in this main pipe at each floor, through which the steam may be turned into the heating-pipes. The latter are arranged in a manner similar to the "multiple arc" system of electric lighting. A 4-inch pipe extends along each side of the building and connects through the valve to the main exhaust; elbows are provided every 7 feet apart, from which run 3-inch pipes across the building, connecting the two 4-inch pipes together. The steam that condenses in these pipes returns to the feed-water heater through a smaller pipe, which connects to a spiral tube submerged in the water in the drums. With this arrangement the back pressure on the engine never exceeds 4 pounds. If for any reason the back pressure should exceed this amount the valve on the roof opens and relieves it. The C. & C. electric motors are built with interchangeable parts throughout, all parts being finished to standard gauges and drilled in standard jigs, while pedestals and caps are milled with standard cutters, thus insuring an interchangeability of parts that could be realized in no other way. From the practical standpoint the success of the plant has been unqualified. From the time steam was first turned on the engine until the present not a single stop for repairs has been necessary, and frequently the shops are run 15 or 16 hours a day.

A staff correspondent of the *Philadelphia Press* telegraphs as follows from Johnstown: "Powell Stackhouse, vice-president of the Cambria Iron Company, was here inspecting the ruined shops of the corporation. He said that the works would be rebuilt at once. The total loss to the company will be, it is thought, not more than \$5,000,000. It was established beyond doubt to-day that two prominent Philadelphians, connected with the Cambria Iron Company, lost their lives. One is Charles Butler, assistant treasurer, whose body was found; the other is Harry Clay Adams, University of Pennsylvania, and a member of the class of 1887, who was elected engineer to assist Mr. Joseph Morgan, the chief engineer. The first attempt was made on Monday to enter the Cambria Iron Works. A gang of 300 men was put to work, and they are removing the debris around the mill. At almost every step dead bodies are being unearthed."

A report is current that the Hudson River tunnel, which was originally intended to be an avenue for railroad freight trains, is to be used to carry water to this city for the syndicate who anticipate grabbing up the Passaic water-shed and making contracts with this city and Brooklyn.

PERSONAL.

Arthur Holland, who has been connected for many years with Naylor & Co., of New York, Philadelphia and Pittsburgh, and who has of late held their power of attorney, was admitted as a member of the firm on the 1st inst.

William Hainsworth, for some years superintendent of the Pittsburgh Steel Casting Company and president of the Hainsworth Steel Company, also of Pittsburgh, has recently resigned both of these positions and sold his interests in the two firms. Mr. Hainsworth, it will be remembered, was the builder of the cast Bessemer-steel gun for the Government, but which failed to stand the test of the Government officials. Mr. Hainsworth's plans for the future are as yet undecided.

The Massachusetts Institute of Technology, of Boston, Francis A. Walker president, last week sent out about 70 graduates, among whom in mechanical engineering were the following: G. M. Basford, A. B. Bellows, W. G. Bixby, Z. W. Bliss, C. N. Borden, L. W. Bridges, H. H. Craigin, C. H. Cromwell, A. L. Davis, N. Durfee, E. V. French, F. W. Hobbs, E. S. Hutchins, L. E. Johnson, L. H. Kunhardt, W. W. Lewis, H. Loring, Jr.; F. E. Sanborn, W. G. Snow, R. Sweetland, W. W. Underhill, A. L. Williston, V. Windett and W. G. Winchett. Willard Goldthwaite Bixby read an abstract of his thesis work on the experimental determination of the strength of cast-iron gears. He was followed by Frederick William Bradley, of the department of electrical engineering, who described an experimental study of a Weston dynamo machine. Nathan Durfee, of the mechanical engineering department, read an abstract on a Wright compound engine at the Troy cotton and woolen manufactory at Fall River, Mass., and James Porter Gilbert, of the chemical course, told of the action of nitric acid on the bromanisols. William Elton Mott, civil engineer, read an abstract which related to experiments on rubber models of riveted joints.

The President has appointed Charles L. Knapp, of New York, to be Consul-General of the United States at Montreal.

William H. Wallace, of New York, the well-known iron and steel merchant, sailed for Europe yesterday on the *Gallia* for the purpose of making an extended visit abroad. He was accompanied by his wife, two daughters and his son, Hon. William C. Wallace, member of Congress from New York City.

Capt. C. B. Sears, of the Engineer Corps, has been detailed by Secretary Proctor to report to Governor Beaver for engineering duty at Johnstown. He will superintend the construction of the pontoon bridges across the Conemaugh.

Public Works Commissioner Thos. F. Gilroy dismissed 30 supernumeraries in his department, a saving to the city of \$53,596 per annum.

John Frost died 3d inst. in Brooklyn, aged 70. His father erected the first iron-works in Brooklyn at Water and Jay street. For 11 years Mr. Frost was foreman of the Novelty Iron Works in New York, and for the last 30 years he had been foreman in Campbell & Thayer's Linseed-Oil Works.

W. H. Anderson & Son, Detroit, Mich., have removed from 38 Clinton street to more commodious quarters at 14 and 16 Macomb street, where they will continue the manufacture of stone, marble and granite workers' tools and supplies.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 50 Dearborn street,
CHICAGO, June 3, 1889.

Pig-Iron.—Orders aggregating thousands of tons were placed during the past week, yet, in all probability, the number of buyers was not larger than in any one of the weeks of the two months previous. Local manufacturers of Agricultural Implements have been feeling the market for some time by insinuating that they would be inclined to buy their next season's supply if it could be had at satisfactory prices. Their offers were always about \$1 per ton below the market price. Dealers were not seeking orders covering ten months' delivery at so great a concession. Lately they have been talking higher prices in a tone of belief, and it is likely that buyer and seller came to terms by meeting each other half way. The placing of orders by these large consumers usually establishes the bottom figures on local Irons and calls into the market others who have been waiting their action. Notwithstanding the fact that it is at least 30 days in advance of customary time when the makers of Farming Implements buy it would not be surprising if the majority of them placed their orders this month. Many makers of Charcoal Iron have notified their agents that they would rather go out of blast than sell at less than what they were now getting, and some are not disposed to accept contracts covering a year's supply. Makers of Local Coke Irons are also firm in their views, but situated so favorably that they can afford to contest any price that may be named to customers of this market. Outside furnaces are making a strong fight to hold their trade and the railroads over which they ship are inclined to assist them by making a reduction in freight rates. Whether rates can be made low enough to be of any benefit remains to be seen. Through this conflict lower figures may result on small lots and carload trade in the near future. On a market fairly active and prospects good we make the following cash quotations, f.o.b. Chicago: Lake Superior Charcoal, \$18.50; Local Coke, No. 1, \$16; No. 2, \$15; No. 3, \$14; Chicago and Bay View Scotch, \$16.50; American Scotch (Blackband), No. 1, \$18 @ \$18.50; Southern Coke, No. 1 Foundry, \$15.75; No. 2 Foundry and No. 1 Soft, \$15; No. 3 Foundry, \$14.50; No. 2 Soft, \$14; Gray Forge, \$13 @ \$13.50; Tennessee Charcoal, No. 1, \$19; No. 2, \$18; Alabama Car-Wheel, \$25.

Bar-Iron.—There were more than the usual number of good-sized orders circulating among the trade last week. Prices were asked on three or four orders, car specifications, several implement specifications, and on stock orders by dealers. Rumor has it that some of these were placed at rates which figure close to \$1.50, f.o.b. Chicago. Should this be true it would be an inside price, as manufacturers are asking \$1.45 for Common and \$1.60 for Single Refined at mill. Many manufacturers who are tired of unprofitable prices and striving to keep their mills employed on small trade refuse to quote on large and long-time contracts, thus giving the impression that the market is improving more force than a close investigation will justify. The market is certainly so very unsettled that it cannot be gauged by any of the recent transactions. This condition will probably continue through the month of June, or until the labor scale for next year is positively settled. From store jobbers are quoting from \$1.75 to \$1.95, according to quality, on small lots, which are in fair demand.

Structural Iron.—Prospects for better trade are slowly improving. Nearly every week adds a little increase to the volume of business, but prices are cut as close as ever. The high waters of the past week damaged many railroad bridges, and manufacturers are already counting on this as a source from which they will obtain orders for material immediately. The demand from country towns for building shapes is very fair. Being largely from standard sizes from stock secures to the seller a better profit than when he must bid against competition for an order. Mill lots f.o.b. Chicago are still quoted as follows: Angles, 2.12¢ @ 2.15¢; Universal Plates, 2.15¢ @ 2.20¢; Sheared Plates, 2.20¢; Tees, 2.55¢; Beams and Channels, 2.90¢. From stocks small lots are quoted at 2.25¢ @ 2.30¢ for Angles, 2.65¢ @ 2.70¢ for Tees and 3.40¢ for Beams.

Plates, Tubes, &c.—Trade was not very brisk in Iron or Steel Plates last week. Consumers were taking only for present requirements in small lots, but the firmness displayed by mills in accepting orders made this a desirable condition of the market. Light-gauge Iron Plates are particularly firm, and to avoid taking further orders some mills have advanced their figures 5¢ per hundred above the market price or withdrawn entirely. Boiler Tubes are firm at the following quotations and another meeting of the manufacturers will be held this week with a view of making an advance in prices. We quote as follows from store: Nos. 10 to 14 Iron Sheets, 2.60¢ @ 2.70¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 57½¢ off for 1½-inch and less and 62½¢ off for 2-inch and larger.

Sheet-Iron.—The condition of the market continues to be very favorable to the seller. Consumers are making strenuous efforts to obtain supplies that were ordered some time back. Manufacturers appear to be utterly unable to keep up with the present demand, and still decline to accept orders for anything except lots of less than 100 tons, which are gauged in price according to quality and the mills' ability to furnish. Quotations on No. 27 range from 2.85¢ to 2.90¢ at mill. Store quotations on No. 27 are pretty firm at 3.10¢ @ 3.20¢, according to the quality of the Iron.

Galvanized Iron.—Trade was quite light in this branch of business. The demand was confined to small lots, and no important orders in sight. Stocks in the hands of dealers and agents are in good supply in all sizes. Jobbers continue the quotation of 65¢ off on Juniata and 65¢ and 5¢ off on Charcoal.

Steel Rails.—Negotiations for large blocks that were started several weeks ago are still open. The aggregate orders for May, it is said, will not exceed 15,000 tons. Small orders are coming in, but in such an irregular way that there is no certainty yet that the Illinois Steel Company will start up another of their mills this month. They continue to quote \$29 @ \$30 on the general run of orders. At this writing it cannot be determined what effect the misfortune of the Cambria Iron Company will have upon the market, if any.

Merchant-Steel.—The buyers who are looking for material to cover their next season's requirements were more numerous last week, and probably some orders were placed, either one of which would fill up some of the smaller manufacturers for the entire year. With the exception of the trade which comes from Harvesting-Machine manufacturers business has been chiefly for small lots of the better

grade of Steel. Soft Bessemer Steels are quoted at 1.80¢ rates at mill. Store prices on other grades are as follows: Mixed Machinery Steel, 2.10¢ @ 2.20¢; Tool Steel, 7.75¢ @ 8¢; Specials, 12¢ @ 25¢; Crucible Spring Steel, 3.50¢ @ 3.60¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Sheet-Steel, 7¢ @ 10¢; Tire Steel, 2.20¢ @ 2.25¢.

Track Supplies.—Indications are that there will be a better business in this line very soon. There are more inquiries for Fish-Plates, Bolts, Spikes, &c., than there have been for several months past, but the whole does not aggregate anything very large in immediate business. In small lots Steel Fish-Plates are quoted at 1.90¢; Iron Fish-Plates, 1.70¢ @ 1.75¢; Bolts with Square Nuts, 2.50¢; Bolts with Hexagon Nuts, 2.65¢; Spikes, 1.90¢ @ 2¢.

Old Rails and Wheels.—There is quite an active demand for Old Iron Rails. Several lots, aggregating 500 to 1000 tons, changed hands at prices equivalent to \$19.50 @ \$20. Chicago stocks are light and demand increasing from Ohio and Eastern mills. There is very little doing in Old Steel Rails. Short lengths are quoted at \$15 @ \$16 and long lengths at \$17.50 @ \$19. There is no demand for Old Car-Wheels. Nominal price would be about \$16. Stocks are abundant and buyers wanted.

Scrap.—The accumulation of stock continues to be a feature of the market. Consumers are making a little more inquiry, but not buying in any quantity. Dealers claim that they cannot afford to shade prices any further, and it is doubtful whether any reduction they might make would be an inducement to purchasers. The majority of transactions for the week were in cheaper grades of material. Dealers quote to consumers per ton of 2000 lb as follows: No. 1 Wrought, \$17.50; Fish-Plates, \$18; Axles, \$22; Horseshoes, \$17; No. 1 Mill, \$13; Cast Machinery, \$11; Stove Plate, \$9; Cast Borings, \$8; Wrought Turnings, \$10.50; Axle Turnings, \$12; Mixed Steel, \$10.50 @ \$11; Coil Steel, \$13.50; Leaf Steel, \$15.

General Hardware.—Trade continues very active on Shelf Goods, Roofing Plates, Tools, Building and House-Furnishing Materials. Copper Sheathing and Copper Bottoms have been reduced 5¢ per 100. Shot have been advanced 15¢, and are now sold at \$1.10 per bag. Paper shells have been advanced from 33½¢ to 20¢ discount on sizes 4 to 12 inclusive on all grades except first quality. Standard Wringers are selling at a reduced price, on account of competition with new makes. The price on Axes is about 50¢ per dozen less than during this period last year. Sales during the past winter were very light.

Nails.—As predicted last week, the Nail market has gone to pieces, and large blocks are being thrown upon the market almost regardless of cost. The dissolution of the Western Association has engendered a reckless spirit which from a superficial aspect indicates that some of the manufacturers are going to sell out their stocks and quit the business or force some of their competitors to do so. Manufacturers' prices cover a wide range, and there is no telling what the bottom is. Jobbers are not inclined to name a price on carloads that they would be governed by under all circumstances, but from the general trade orders would be accepted at \$1.85 rates and small lots at \$1.90 rates, regular terms. Wire Nails have been advanced about 10¢ per keg on an average by manufacturers making 60d the base. This reduces the price on the small sizes and advances it on the larger sizes. Jobbers quote \$2.30 in carloads and \$2.35 in small lots.

Barb-Wire.—There is no change from the conditions reported last week. The

demand continues good for small lots, and mills are still working on orders. On Painted Wire from store 2.75¢ is quoted, and on Galvanized, 3.35¢. No concessions for carloads.

Pig-Lead.—The market has been quiet but firm. Sales of some 400 tons are reported at figures ranging from 3.75¢ to 3.80¢.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., June 4, 1889.

The disaster at Johnstown has absorbed the attention of the trade during the past two or three days, and as yet everything is unsettled, so that it is almost impossible for manufacturers to know where they stand. Apart from the great loss at the Cambria Iron Company's Works, there is the interruption to transportation and the uncertainty in regard to the supply of Coke, Soft Coal, &c. Then there is a possibility that smaller mills along the Susquehanna and at other points may be disabled for some time, so that it is impossible to form any definite idea of the immediate capacity for production, as mills not directly affected by the floods may be seriously embarrassed by the difficulty in obtaining supplies of various kinds. In the meantime those who are in a position to accept orders ask from $\frac{1}{16}$ ¢ to $\frac{1}{8}$ ¢ advance on Plates and Angles, and in fact more money is asked for nearly all kinds of Finished Iron. Until this terrible calamity occurred the entire market was beginning to show strength and activity, and it may be that the extraordinary turn of events may give an impetus toward a general advance. This article has to deal with things from a business stand-point, so that it will omit all other references. In doing so, it may be said that the trade are a little undecided as to the immediate course of the market. The impression is that it will cause an immediate stiffening in all kinds of Finished Iron and Steel, but it may not affect Pig-Iron. Finished Iron and Steel will be wanted immediately and in large quantities, while there will be a serious falling off in production. The Cambria Iron Company are not only out of the market, but the orders which that company had on their books will have to be placed elsewhere. Many smaller mills have doubtless been crippled so that they will not be in a position to do much until after mid-summer, while those that are able to run find their fuel supply in a most precarious position. These considerations naturally cause sellers to hesitate in naming quotations, as there is a possibility of an advance being started along the entire line. As regards Pig-Iron, the position is somewhat different. If the mills cannot run they will not need much Pig-Iron, but if the curtailment of the fuel supply affects the mills it must also to some extent affect the furnaces, so that the chances are that Pig-Iron will not accumulate to any extent; neither will prices be materially affected in either direction. Up to this time (Tuesday, p.m.) quite a number of the Philadelphia representatives of mills and furnaces have not yet been able to communicate with their principals, so that it is impossible to know what condition they are in; hence, so far as they are concerned, all business is in abeyance.

Pig-Iron.—As already stated, the market is unsettled, and prices feverish and irregular. There is a great deal of inquiry for Iron, but whether due to actual requirements or whether they are "feelers" can hardly be determined at present. The disposition among holders is to quote firmly at last week's quotations, and in no case to accept very large orders or to make concessions. This, however, may be only temporary, and perhaps preliminary to an advance, although that, of course, is mere

conjecture. As a matter of fact it is impossible to form any definite opinion in the present unsettled state of the market, although the general impression is that it will ultimately develop into higher prices. In the meantime it is difficult to place orders at the inside quotations, so that \$17 @ \$18, delivered, about covers the market for No. 1 Foundry, \$16 @ \$16.50 for No. 2 and \$14.75 @ \$15 for Gray Forge. Southern Irons are held firmly at \$15.50 @ \$16 for No. 2, and \$16.50 @ \$17 for No. 1, delivered in consumers' yards, with only moderate offerings at those figures.

Blooms.—The feeling in Steel Blooms is very firm, as quite a number of orders placed with the Cambria will have to be duplicated elsewhere. At the moment it is difficult to get firm quotations on large lots, but in a general way holders ask an advance on last week's prices, which were as follows: \$28 @ \$28.50, at mill, for Nail Slabs; \$30 @ \$31 for Tank Slabs; \$32.50 @ \$33.50 for Shell Slabs; \$36 @ \$37 for Flange, and \$38 @ \$40 for Fire-Box; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 ½ "Bloom" ton of 2464 lb.

Muck Bars.—There is more inquiry, but very few Bars are offered. Sales were made last week at \$27, delivered, but it would be difficult to get anything to-day less than \$27.50.

Bar-Iron.—In the absence of actual sales it is difficult to quote exact prices, although there is no doubt that they would be from $\frac{1}{16}$ ¢ to $\frac{1}{8}$ ¢ higher than they were a week ago. Manufacturers hardly know what figures to name on large lots, although their regular customers could probably secure moderate supplies at from \$1.75 to \$1.85 for best Refined Bars. There is a great deal of inquiry from consumers, but to what extent Bars may be actually required remains to be seen.

Plate and Tank Material.—Inquiries are numerous, and requirements will doubtless be very large during the next three or four months. Mills are already full of work, and are not quoting on anything additional, unless at advances of from \$1 to \$2 ½ ton or more. We repeat last week's quotations, although, as we have said, they are doubtless below what would be accepted to-day—viz., 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2¢ @ 2.1¢ for Universal Plates; Shell, 2.3¢ @ 2.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.25¢; Shell, 2.5¢; Flange, 2½¢ @ 3¢; Fire-Box, 3½¢ @ 4¢.

Structural Material.—There is a great deal of inquiry to-day, and a large amount of business will undoubtedly be placed as soon as terms can be arranged. The mills are already pretty well employed, and the sudden demand likely to be thrown upon them will be likely to lead to a decided stiffening in prices. Quotations under present conditions are liable to be somewhat irregular, but to-day's figures are about as follows: Bridge Plate, 2.05¢ @ 2.10¢; Angles, 1.95¢ @ 2¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet-Iron.—The demand keeps up very satisfactorily, and while there is no change to note in prices, everything is held at last week's figures, viz.:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined No. 28.....	3.60¢
Common, $\frac{1}{4}$ ¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3½¢
Best Soft Steel, Nos. 21 to 24.....	3¾¢
Best Soft Steel, Nos. 25 to 26.....	3¾¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, $\frac{1}{4}$ ¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.63 %
Common, discount.....	.67½ %

Steel Rails.—It is stated that a number of options have been accepted within the past few days, and that manufacturers are now asking advances of more or less importance. In this market \$28, at mill, is said to be a firm quotation, and under present conditions it is extremely doubtful if that figure could be shaded. The feeling in Rails and Steel of all kinds shows increasing firmness along the entire line.

Old Rails.—There is no apparent change in this department, although so far as known there has been no business whatever during the week. Buyers could be found at \$22.50 to \$23, delivered, but they are held for \$23 and upward.

Scrap-Iron.—Holders ask outside prices, and although transaction have been somewhat limited, the feeling is very firm at \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish-Plates, \$23 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

Wrought-Iron Pipe.—The demand is very active and prices strong, with an upward tendency, although as yet discounts remain as before, viz.: Butt-Welded Black, 52½ %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 52½ %; Boiler Tubes, 60 %.

Nails.—In sympathy with the rest of the market, the feeling is feverish and unsettled. It is difficult to quote prices to-day, but a general advance from the recent low figures appears to be pending.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, June 3, 1889.

Pig-Iron.—Neither buyers nor sellers of Pig-Iron in the local market have changed attitudes during the past week. The depression noted for several weeks has given place to a despondent tone in some quarters, while in other instances interested parties have simply deferred hope of improvement. Sellers attach much importance to the fact that four furnaces have blown out in the South, either because they could not or would not submit to the low prices current, but buyers are not slow to oppose the fact that three other furnaces in the same district have resumed operations during the week, so that there is little strength to be gained from the changes. But while prices have continued low, the volume of business has increased some. The very lowest prices which have been named have been either for small amounts or for near delivery, producers refusing to sell for long delivery at prices now current. Agricultural works have been especially anxious to place orders for round amounts for 8 to 12 months. There has also been some talk of Pipe works placing large contracts. Among the sales during the week were 1200 tons No. 3 Southern Foundry Coke Iron at \$13; 1000 tons Mottled at \$11.75, cash; 2500 tons of mixed grades Foundry Iron, of which 1000 tons were of Softeners, on basis of quotations; 1000 tons Gray Forge at \$12.75, and a few 100-ton lots at \$12.50. In addition sales of 2500 and 1000 tons were reported on Saturday. There has also been a better inquiry for Car-Wheel Iron. Most of the demand was experienced late in the week, so that the market closes under more favorable auspices than the facts recited early in the week would lead one to suppose. The fact is, with prices below the productive point, but little risk can be run by those in need of Iron for some little

time. The following are the approximate prices current here at the close for cash, f.o.b.:

Foundry.		
Southern Coke, No. 1 (new classification).....	\$14.00 @	\$14.50
Southern Coke, No. 2 (new classification).....	13.50 @	14.00
Southern Coke, No. 3 (new classification).....	13.00 @	13.50
Ohio Soft Stone Coal, No. 1.....	15.50 @	16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @	15.25
Mahoning and Shenango Valley.....	16.00 @	16.50
Hanging Rock Charcoal, No. 1.....	20.00 @	22.00
Hanging Rock Charcoal, No. 2.....	19.00 @	21.00
Tennessee and Alabama Charcoal, No. 1.....	17.50 @	18.00
Tennessee and Alabama Charcoal, No. 2.....	16.50 @	17.00
Forge.		
Strong Neutral Coke.....	12.75 @	13.00
Mottled Neutral Coke.....	11.75 @	12.00
Gray Forge.....	12.50 @	12.75
Car-Wheel and Malleable Irons.		
Southern Car-Wheel.....	20.00 @	24.00
Hanging Rock, Cold Blast.....	22.00 @	25.00
Lake Superior Car-Wheel and Malleable.....	20.00 @	21.00

Manufactured Iron.—An easy tone has prevailed, but in a few instances both mills and foundries have secured better orders, which is encouraging.

Nails.—The demand has been only moderate and the market easy, without further change in prices. Steel Nails, 12d and 40d, sell at \$1.80 @ \$1.90 $\frac{1}{2}$ keg, with 10¢ rebate in carload lots at the mills, and Steel Wire Nails at \$2.40 @ \$2.50 $\frac{1}{2}$ keg.

Old Material.—There have been moderate offerings of Old Rails, but little demand, at \$20, spot. Old Wheels have been in light demand, but small sales are reported at \$16, cash.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st.,
St. Louis, June 3, 1889.

Pig-Iron.—A better feeling prevails in this department. Inquiries for some good round lots have been received during the past week, and indications point to an increased demand at an early period. Everyone seems to think that bottom has been reached, and while prices may remain stationary for some time, they confidently expect any change will be for the better, and base their anticipations on the fact that a number of furnaces have blown out and those that are in blast are well filled with orders, while consumption is steadily on the increase. There are a few furnaces, however, that seem disposed to quote some very low prices, and until they have entered enough orders to keep them running it is useless to expect any advance in prices. On the other hand, there are those that express confidence in the future and refuse to meet these low quotations. For ordinary-sized lots we quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry, \$15.25 @	\$15.75
Southern Coke, No. 2 Foundry, 14.75 @	15.25
Southern Coke, No. 3 Foundry, 14.25 @	14.50
Gray Forge.....	13.25 @ 13.75
Ohio Softeners.....	17.00 @ 19.00
Lake Superior Charcoal.....	19.75 @ 21.50

Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

Tennessee.

Charcoal Foundry, No. 1.....	17.00 @ 18.00
Charcoal Foundry, No. 2.....	16.50 @ 17.00

Connellsville Coke, f.o.b. East St. Louis, \$4.55; St. Louis, \$4.70.

Bar-Iron.—Business is confined mostly to small orders, on which the mills are kept fairly well employed. The demand for Iron for railroad work is on the increase, and the country merchants are purchasers of some fair-sized lots. Prices remain as last quoted, as follows: Small lots from store, \$1.80; Carload lots from \$1.60 to \$1.70, according to circumstances.

Barb-Wire.—Mills are fairly well employed and the demand seems in a fair way to keep up during the summer months.

The demand from the South and Southwest has been especially large, and mills have been running full time and have had no opportunity to accumulate any stock. Prices remain unchanged, but are quoted with considerable firmness as follows: From \$2.80 to \$2.85 for Painted and from \$3.40 to \$3.45 for Galvanized; carload lots from \$2.70 to \$2.75 for Painted and \$3.30 to \$3.35 for Galvanized, f.o.b. St. Louis.

Cleveland.

CLEVELAND, June 3, 1889.

Iron Ore.—The amount of Ore now sold is estimated at 3,750,000 tons. Considerable Gogebic Ore at \$5 $\frac{1}{2}$ ton is being placed, and round lots of Minnesota Ore at \$5.75 are in demand. The market has not been particularly active during the week just closed, but furnace men at Pittsburgh and in the Mahoning and Shenango Valleys are beginning to buy quite liberally, and orders aggregating 500,000 tons may be expected from these districts within the next few days. A determined effort has been made to force up Lake freights, but the last charters reported were at the figures prevailing since the opening of navigation. It is possible that the Escanaba rate may be forced to \$1, but efforts in that direction will be vigorously resisted. Non-Bessemer Ores at \$3 60 @ \$4 are again selling quite freely, and the sale of 5000 tons of a special high grade of Bessemer Ore, containing less than 0.02 % of phosphorous, at \$6.25, f.o.b. vessels Cleveland, is reported. The receipts of Ore at Cleveland during May were 213,275 tons, and the shipments from the local docks to the furnaces were 90,092 tons.

Pig-Iron.—The faith of the furnace men in the early improvement of the market is exemplified by their liberal purchases of Ore at about the same prices paid last year, when their own products were quoted much higher than at present. The amount of Ore already sold is far in advance of the record up to a corresponding time last year. There has been a steady demand for Iron during the past week, but the sales were confined to small amounts. Dealers believe, however, that the aggregate amount sold is in excess of the record for any preceding week in May. The following are market prices to-day:

Nos. 1 to 6 Lake Superior Charcoal.....	\$20.00 @ \$20.50
No. 1 Strong Foundry, Bessemer quality, $\frac{1}{2}$ ton.....	16.50 @ 17.00
No. 1 Strong Foundry, $\frac{1}{2}$ ton.....	16.00 @ 17.00
No. 2 Strong Foundry, $\frac{1}{2}$ ton.....	15.00 @ 16.00
No. 1 American Scotch, $\frac{1}{2}$ ton.....	16.50 @ 17.00
No. 2 American Scotch, $\frac{1}{2}$ ton.....	15.50 @ 16.50
No. 1 Soft Silvery, $\frac{1}{2}$ ton.....	17.00 @ 18.00
Mahoning and Shenango Valley Neutral Mill Irons, $\frac{1}{2}$ ton.....	14.00 @ 15.00
Mahoning and Shenango Valley Red Short Mills, $\frac{1}{2}$ ton.....	14.50 @ 15.50

Manufactured Iron.—The market is not active, but there is a demand for Common Bar at 1.60¢. Combination shapes are freely inquired for, but Steels are dull.

Old Rails.—A few sales of Old American Rails at \$21 are reported. Old Wheels are plenty but are not in great demand.

Detroit.

WILLIAM F. JARVIS & Co., under date of June 3, 1889, report as follows: There is very little change in the situation here since our last report. While the buying is mostly confined to carloads and 50-ton lots, a few larger sales have been booked and inquiries for several thousand tons have been received, but as the prices buyers are offering are in most cases considerably lower than sellers will accept these inquiries may not result in immediate sales. As soon as buyers become convinced that prices have reached bottom there will be an active demand, and prices will at once become firmer and go higher. The number of Lake Superior Charcoal furnaces

that are out of blast will soon reduce any surplus there may be of this class of iron. Out of five furnaces in Detroit or in the near vicinity, with a total weekly capacity of about 1400 tons, three are out of blast and the two in blast have a weekly output of only about 400 tons, and there are several others in the State also idle. We report a quiet market, with prices as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.00 @ 19.00
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.00 @ 19.00
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.00 @ 16.50
Jackson County (Ohio) Silvery.....	18.00 @ 18.75
Old Wheels.....	18.50 @ 19.00

Louisville.

LOUISVILLE, KY., June 3, 1889.

Pig-Iron.—There has been some change in prices during the last week, and some sales have been made for deliveries running through the year. Buyers in territory adjoining this district have also made purchases for their wants, extending through the season; and the indications are that where sales can be effected at present prices buyers are disposed to take hold and purchase for the next seven months' delivery. There is a scarcity of Bright and Silver Gray Iron where buyers desire immediate shipment. Of the new Southern furnaces which have gone in blast, Lady Ensley and Trussville are meeting with much favor. The Irons of both are strong and well graded. Lady Ensley is made of all-brown Hematite Ore and Pocahontas Coke. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.25 @ \$14.75
Southern Coke, No. 2 Foundry, new classification.....	13.75 @ 14.25
Southern Coke, No. 3 Foundry, new classification.....	13.00 @ 13.50
Gray Forge.....	12.50 @ 13.00
White and Mottled, different grades.....	12.00 @ 12.50
Silver Gray, different grades.....	12.50 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.00 @ 16.50
" " No. 1 Mill.....	14.50 @ 15.00
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 22.75

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,
CHATTANOOGA, June 3, 1889.

Pig-Iron.—The market is still in a waiting mood, and nearly everybody appears to think that improvement in prices will soon begin to appear. There is demand enough now, and judging from inquiries, which are more numerous than they were a month or so ago, better prices are not far off. The feelings of our Pig-Iron producers are much more hopeful than they have been in some time, and the impression seems to have gone forth that there is going to be a decided change for the better very soon. There seems to be just now a combination of circumstances that has induced such a feeling, besides the slight improvement that has already manifested itself. There has been during the past week much more inquiry than formerly, and there is a decided tendency manifested by buyers to make large contracts to extend all through the year, but without an exception producers are not listening to any such propositions, but are content to sell for deliveries only in the near future, and from now until the close of the present year there will be fewer long-time-delivery contracts made probably than at any time in the past. Notwithstanding the apparent depression in the Pig-Iron-producing business, the question of erecting new plants appears to be as active as ever. The subject of the manufacture of Basic Steel appears rather to have given an impetus to the

Iron question South, and the feeling is quite animated. The interest that is being taken in the Iron-making business South was never as much manifested as it is at the present time, and the question of Pig-Iron of the past and present is not so much talked of or thought of as the Pig-Iron of the future, and what it is going to be.

New York.

Office of *The Iron Age*, 66 and 68 Duane street,
NEW YORK, June 5, 1889.

The floods which have devastated a large part of Pennsylvania, extending into New York on the north and Maryland and Virginia on the south, seriously interrupted business during the past week. Railroad bridges were washed out by the score, embankments and trestles were destroyed, and for several days important industrial centers in Pennsylvania were wholly deprived of all communication with the surrounding country. Among the railroads the Pennsylvania system was the chief sufferer, the main line and some of the most important branches having been seriously damaged. The loss of life has been appalling, but in addition to that many large industrial establishments have been so nearly destroyed that for some time the dependent population will be without the means of earning a livelihood. The pecuniary loss attendant upon these most extraordinary floods for the time of the year will aggregate many millions of dollars. The only ray of comfort to be taken out of this calamitous condition of affairs is the necessarily heavy demand for materials which will be required to repair damages to railroads and other interests, making the Iron trade a prominent beneficiary.

Pig-Iron.—A great many inquiries are in the market and some heavy sales of Southern Iron are reported. The representatives of Southern furnaces state that their principals generally are notifying them to exercise caution in quoting for future delivery. Large consumers in the West have purchased so freely of late that in view of the decreasing output of Iron a reasonable hope is entertained of better prices in the near future. Some go so far as to say that the consumers who have steadily refused to make contracts for their future requirements will shortly find that they have waited too long for the market to touch bottom and that they have lost their opportunity to buy cheap. The low sale of Southern Iron at Cleveland reported in the daily press was not worth making a sensation over. The prices given was not an unusual one in the West and does not indicate further demoralization. Northern furnacemen are also in better heart, as their customers are calling for prompt shipments on contracts, and the quantity of Iron moving is very large as compared with the output. Northern Iron is quoted at \$16.50 @ \$17.50 for No. 1; \$15.50 @ \$16 for No. 2; \$14.50 @ \$15.25 for Gray Forge, all at tidewater. Southern Iron is quoted at \$16 @ \$16.50 for No. 1; \$15.50 for No. 2 Foundry and No. 1 Soft; \$14.75 @ \$15 for No. 3 Foundry and No. 2 Soft; \$14 @ \$15 for Gray Forge, all delivered at New York.

Scotch Pig.—Nothing is doing in this line of any special consequence. Quotations continue as follows: Dalmellington, \$19.50; Summerlee, \$21.50; Coltness, \$21.75.

Spiegeleisen.—A temporary demand was experienced during the past week, but consumers generally are so well supplied that not much business is looked for at present. Importers quote 20 % at \$28; 80 % Ferro is in more regular demand, but in very small lots, at \$57 @ \$58.

Bar-Iron.—Only small orders have been taken at old rates—namely: Common, 1.6¢ @ 1.65¢; Medium, 1.7¢; Refined, 1.75¢ @ 1.9¢, for carload lots on dock.

Structural Iron and Steel.—Prices are firm in this class of material, and the decline seems to have been checked. Business is very good and promises to be still heavier. Quotations for delivery on dock are as follows: Sheared Plates, 1.95¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.15¢; Angles, 2¢ @ 2.1¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢.

Plates.—The market is strong, with a large demand. Locomotive builders are receiving more orders, and are purchasing quite freely. While no advance has been made as yet, the condition of trade has improved very materially, and manufacturers are not disposed to load up too heavily at present prices. Dock deliveries are quoted as follows: Iron Tank, 1.95¢ @ 2.1¢; Shell, 2¢ @ 2.5¢; Steel Tank, 2.2¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.65¢ @ 2.75¢; Fire-box, 3.25¢ @ 4¢.

Merchant-Steel.—A fair volume of business is in progress, but only small lots are moving. Prices are still badly demoralized. Good brands of Tool Steel, in large lots, are quoted at 7¢ @ 7½¢; specials, 12½¢ @ 20¢; Crucible Spring, 3½¢ @ 4¢; good Open-Hearth Machinery, 2.30¢ @ 2.5¢; common ditto, 2¢ @ 2.25¢; Open-Hearth Spring, 2½¢ @ 2.5¢; Sheet, 6½¢, 8½¢ and 10½¢.

Steel Rails.—The sales made in the past week aggregate about 25,000 tons. A number of round lots are being negotiated, and inquiries have grown a little more frequent, buyers doubtless anticipating an advance in price in consequence of the improved condition of the mills. The manufacturers are helping along this feeling by quoting \$27 at mill and insisting that they intend to make it their bottom rate. The disaster which has overtaken the Cambria works is not without its effect also. That mill is not only out of the race for an indefinite time, but it will probably be obliged to distribute its orders among the other Rail companies.

Track Supplies.—Large orders are coming up in the wake of the heavy Rail contracts recently made, but thus far it is not known that any of them have been placed. Quotations for Fish-Plates continue at 1.80¢ @ 1.90¢; Track Bolts, Square Nuts, 2.70¢ @ 2.75¢; Hexagon Nuts, 2.80¢ for Common Iron and 3¢ for Refined; Spikes, 1.90¢ @ 2¢.

Old Material.—A better feeling is reported with regard to Old Rails and Scrap, in consequence of the growing inquiry. Consumers bid \$22 for Old Rails, but holders are not willing to sell at that figure. For No. 1 Wrought Scrap \$20 is bid, but \$21 is asked. Other Old Material continues dull at about \$13.50 @ \$14 for Turnings, delivered; \$15 @ \$16 for Cast Scrap, and \$9.50 @ \$10 for Cast Borings.

Wire-Rods.—A little inquiry for prompt lots is reported, due probably to the cutting off of the Cambria supply. Foreign Rods are very high, owing to the German labor troubles, which still continue, and most makers abroad are unwilling to quote. Prices are now ranging at about \$42.50, New York.

Blooms and Billets.—No business is doing in foreign. An inquiry for Basic Billets elicited a quotation of \$33.50, ex-ship, which was too far above competing domestic Billets to lead to a sale.

Messrs. Naylor & Co., 99 John street, New York, have issued the following circular letter, under date of June 1: "Referring to the annexed circular of the Tennessee Coal, Iron and Railroad Company, we are now ready to receive orders for

Pig-Iron manufactured by that company, and shall be glad to be favored with your inquiries at our offices in New York, Philadelphia and Pittsburgh." The circular of the company, which is dated at Nashville, Tenn., June 1, is as follows: "We have arranged with Messrs. Naylor & Co., New York, to sell the Pig-Iron manufactured by this company in New England, Pennsylvania, New Jersey, Delaware, Maryland, Virginia and the cities of Wheeling, W. Va.; Louisville, Ky.; Jeffersonville, Fort Wayne and Lafayette, Ind.; and Chicago, Hegewisch and Pullman, Ill.; and we shall be glad if you will address all inquiries after this date to them or their houses in Philadelphia and Pittsburgh. All sale contracts will be signed by Messrs. Naylor & Co. in the name of the company, as its agents. All payments are to be made direct to Messrs. Naylor & Co., who will give receipt for them in the company's name."

Financial.

For the time being all thoughts are absorbed by the catastrophe in Pennsylvania, the number of whose dead Governor Beaver computes at something like 10,000, while the property loss is between \$25,000,000 and \$40,000,000. Maryland loses, according to some estimates, \$5,000,000, and several millions more must be added for property destroyed in New York and Virginia. To a large extent these figures represent the destruction of bridges, factories and lumber. A cheering feature is the enthusiasm everywhere shown in extending relief to the sufferers, all the mercantile exchanges in New York being among the contributors, besides corporations, bankers and individuals. The Reading Company send \$25,000, and Philadelphia promises \$500,000 by Saturday night. Half of the Reading's 40 collieries were flooded, but will be restored within a week. The suspension of mining in all the anthracite region is interrupted by damage to breakers and other colliery machinery, and transportation in the mining regions will be seriously embarrassed for several days.

An event of the week was the sale at auction by jobbers of \$3,500,000 worth of flannels at an advance of 5 % on prices over those of last year, though not commensurate with the increased cost of wool. The effect was to strengthen confidence in values. Alex. McKay, general freight agent of the Michigan Central, and five of his subordinates were indicted by the United States Grand Jury, at Chicago, on Saturday, for violation of the Interstate Commerce law in giving a shipper a rebate on grain rates. It is the most important action since the passage of the Interstate law, showing that the commission has stopped advising and is now inflicting penalties.

The Stock Exchange markets were considerably affected by advices from Pennsylvania. The stock of the Cambria Iron Company, which has been badly stricken by the calamity, is strongly held. On Monday in Philadelphia more of this stock was offered, showing the stockholders not to be much disturbed, but in New York it dropped from 250 to 50. The Cambria Company, with \$4,000,000 capital, the *Press* says, "have assets valued at figures approximating \$12,000,000. The Johnstown plant, while valuable, was comparatively only a small part, and the losses, estimated at \$2,000,000 to \$2,500,000, even with the loss of traffic and business until work is resumed, can be deducted and still leave a most valuable property." In Wall street the market was weak and irregular under the pressure of realizing sales. The silencing of the stock tickers by order of the Governing Committee, it is hoped, will be effective in stopping the

"bucket-shop" business. Government bonds were steady. Sales of \$5000 coupon 4s were reported at the board at 129½. The Treasury accepted \$60,000 4½s at 106½. Quotations as follows:

U. S. 4½s, 1891, registered.....	106½
U. S. 4½s, 1891, coupon.....	107½
U. S. 4s, 1907, registered.....	128
U. S. 4s, 1907, coupon.....	129
U. S. currency 6s.....	119

On Tuesday stocks were generally strong. The announcement was made that the Southern Pacific had not left the Transcontinental Association, and would continue to work in harmony with the other roads, but in competition with the Canadian Pacific. The coalers were not much affected by the news from Pennsylvania. Although the number of collieries drowned out is large, particularly in the Mahanoy and Centralia regions, it is likely that the mines whose operations are not seriously impaired by the flood will be worked so as to make up for the stoppage of production by others. It was reported that \$750,000 more in gold had been ordered for Wednesday's steamer, and that shipments to the extent of \$5,000,000 to \$10,000,000 during June are not improbable.

General trade is hardly satisfactory, although the Clearing-House returns from 39 cities show an increase of 22.3 % in the volume of transactions, indicating considerable activity. New York gained 35.6 %, Boston 12 %, St. Louis 19.3 %.

In breadstuffs there is a heavy feeling, with easy figures for some grades. Holders of wheat are less eager to sell. Corn is firmer on reports of damaging rains in the West. Exports of wheat for the week from the United States comprised 350,000 bushels and of corn 1,570,000 bushels. Coffee is dull. Cotton is steady at ½¢ advance for spot on fair demand. Provisions are in demand for export at steady prices. Sugars are advanced ½¢ all round, and business is fairly active. Teas are firm. Tobacco steady. In ocean freights there is increased urgency in the demand for tonnage, in good part for petroleum, lumber, timber and grain.

The weekly bank statement of Saturday showed a decrease of nearly \$500,000 in surplus, but the gold shipped on that day was not reflected. Loans were contracted \$714,900, specie decreased \$1,792,500, legal tenders were up \$1,422,100. Time loans are 2½ % for 60 @ 90 days, 3 for four months and 4 @ 4½ for the remainder of the year, but lenders are indisposed to make contracts maturing after October. The supply of commercial paper is limited. Rates are 3 @ 3½ % for 60 @ 90 day indorsed bills and 4 @ 5½ % for longer dates. Of the June interest and dividend disbursements the railroads pay out about \$24,000,000, and the General Government \$1,670,000 as interest on the 4½ %. The semi-annual disbursements payable in Boston in June amount to \$5,534,764, as compared with \$4,890,410 last year.

Sterling exchange is firm, with posted rates at \$4.88 @ \$4.90. Gold to the amount of \$3,396,704 went to Europe on Saturday, chiefly to the Continent, the Paris and Berlin rates enabling exports to be profitably made. According to the Custom-House reports the exports of specie from this port during the week were \$4,107,653, making a total since January 1 of \$31,775,000, as compared with \$17,096,000 for the same time last year. The imports were \$257,000.

The imports of merchandise at this port during the week were valued at \$10,029,700, of which \$2,171,000 represents dry goods. Since January 1 the total valuation is \$216,306,000, against \$204,881,000 for the corresponding period last year and \$200,200,000 in 1887.

The Signal Service weather crop bulletin reports that low temperature, local frosts and excess of rain operated unfavorably

upon the crops in the States north of the Ohio River. The recent heavy rains, however, were beneficial in relieving the drought in the cotton States, and also improved the agricultural outlook in Kentucky, Tennessee, Arkansas and Texas. Harvest prospects are believed to be better than a year ago.

The new iron rate between Youngstown and Chicago, which goes into effect June 8, 15¢, is the lowest in eight years. At a meeting of the freight agents of all railroads of Detroit and Toledo, held at Toledo on Tuesday, rates were fixed at a figure that will allow the Eastern iron mills to compete with the Chicago reduction. The principal rates fixed were: Youngstown to Chicago, 9¢ in carload lots; Toledo to Chicago, 7¢; Cleveland to Chicago, 8¢; Toledo to Indianapolis or *vice versa*, 7¢; Toledo and Cleveland, 5¢. Nothing definite has been accomplished thus far in the attempted adjustment of the Oregon Railway joint lease and other matters affecting Pacific Coast connections. An important change in freight rates has been announced to take effect on June 10 between New York and New Orleans.

Metal Market.

Copper.—Spot Copper improved for the week in the London market from £41. 2/6 last Wednesday to £41. 12/6 yesterday, and futures from £41 to £41. 5/, with sales of 1800 tons all told. Statistics showed an improvement on the 1st inst., the visible supply in England and France having decreased from May 1 some 7000 tons, the deliveries in these countries aggregating 13,900 tons for May, which shows a good revival of consumptive inquiry. The London *Economist* of May 25 prints a very sensible editorial on the general Copper situation, winding up with the following paragraph: "As a matter of fact we fail to see how any good can be effected by a combination of producers. We believe that the Copper market had better be left free to seek its own natural level. If this be done, those who at present hold large stocks of Copper may find it expedient or may be forced to realize; but that would be a decided gain, for then the metal would the more quickly pass into consumption under the stimulus of low prices. After such a liquidation the position would be comparatively healthy and Copper producers, after a short period of difficulty, would reap a permanent advantage." The Boston and Montana mine made the largest product in its history in May, getting out 2,520,100 lb of Fine Copper and 33,000 ounces of Silver. The whole figured at a gross value of \$325,000, and all expenses at not over \$200,000. The total product thus far in the fiscal year (11 months) is 21,630,553 lb of Copper and 116,782 ounces of Silver, against 7,000,000 lb of Copper and no Silver at the same time last year. There has been no change in our own market, the nominal quotation for Lake Ingot being 12½¢ @ 12¾¢, and 11¢ @ 11¾¢ for casting brands, while at 12¢ the regular customers of the mining companies continue being supplied by them. June sold at 12.10¢. The Mansfield Copper Company, of Eisleben, Germany, produced in 1888 13,579 tons Fine, being 356 tons in excess of 1887.

Tin.—Has followed a downward course once more in London, giving way from £92 last Wednesday to £91 with spot yesterday, and futures from £92. 17/ to £91. 15/. This decline was all the less expected, since the visible supply in Europe and America on June 1 showed a decrease of 1140 tons when compared with that of May 1. London sales for the week, 600 tons. Our own market followed suit all the more readily, as the comparatively light consumptive demand is confronted by a superabundance of available Tin of-

fering. June was sold down to 20.40¢, August from 20.55¢ down to 20.45¢, the latter and spot being obtainable at 20.35¢ last night. Our market to-day closes dull and uninteresting at nominally 20½¢ on the spot. **Tin-Plates.**—There has been no particular change since our last report, the moderate demand being met by dealers slightly under importers' price. We do not alter our quotations. On the other side there is a difference of about 3d per box between makers and buyers; should the former yield quite a large business would doubtless be done. We quote large lines, ordinary brands, per box: Siemens-Martin Steel, Charcoal finish, \$4.75 @ \$5.50; Coke finish, \$4.55 @ \$4.65; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.25 @ \$4.35, and Wasters \$4.12½ @ \$4.15.

Lead.—Sales for the week in the open market sum up to 400 tons at 3.92½¢ to 3.97½¢, the closing figure being 4¢, and as much as 4.10¢ asked. St. Louis has been strong, advancing to 3.85¢ @ 3.90¢.

Spelter.—The demand being good and the supply to meet it barely sufficient, Common Domestic Spelter has further improved, and is now held at 5¢, a sale having been made yesterday at 4.90¢. Silesian is unchanged, 5½¢. High-priced Ores, Coal and higher wages in Germany lend strength to the position out there.

Antimony.—The notable advance in London has caused an improvement here to 13½¢ for Hallett and 14½¢ @ 14¾¢ Cookson, at which a moderate consumptive demand is being supplied.

New York Metal Exchange.

The following sales are reported:

FRIDAY, May 31.	
32 tons Lead, August.....	3.97¢
16 tons Tin, September.....	3.95¢
MONDAY, June 3.	
10 tons Tin, June.....	20.40¢
25 tons Tin, August.....	20.55¢
25 tons Tin, August (2d half).....	20.45¢
16 tons Lead, August.....	3.95¢
50 tons Lead, spot.....	3.95¢
50 tons Lead, spot.....	3.92½¢

Coal Market.

The New York market for Anthracite is dull and quiet, few sales being reported at the advanced schedule which took effect on Saturday. The future is largely dependent on the extent of damage from the disastrous floods, respecting which there are numerous telegrams, with little definite information. At Shamokin all the collieries were forced to suspend and, many were drowned out. All the collieries in the Mahanoy Valley and at Centralia are drowned out to an extent that will incapacitate them for work at least two weeks. One account says that only 20 of the 40 collieries of the Reading Company are in operation. At Hazleton the work of getting out Coal is stopped. Some of the collieries are completely drowned. Lattimer No. 3 and Mt. Pleasant No. 1, belonging to A. Pardee & Co., are said to be in the worst condition. At Carmel, where 6000 hands are employed, work in two large mines is indefinitely suspended, nearly all the pumps being under water. At Ashland not a single colliery in a list of nearly a score but is drowned out and much of the machinery is submerged. Gigantic pumps make no headway against the water. In the Pine Grove regions the collieries are filled with water. Every mule at Brookside Colliery, the largest of the Philadelphia and Reading Coal and Iron Company collieries, was hoisted. No coal trains are able to reach the collieries. The announcement is made that the Chesapeake and Ohio Canal had been irreparably damaged and will be abandoned. This means that its Coal business from the Cumberland region will now be divided

among the railroads leading to tidewater. A dispatch from Corning, in this State, referring to the floods, says the Fall Brook Coal Company lose heavily—that “\$1,000,000 will not cover the loss.” Added to other embarrassments in the mining regions, transportation is interrupted, so that at least a week must elapse before the Coal trade can be restored to anything like normal conditions. Meanwhile supplies at tidewater are sufficient for the emergency. The reported production for the week is 608,552 tons, a decrease of 100,000 tons compared with the previous week, but an increase of 64,000 tons compared with the same week last year. Since January 1 the total is 12,129,813 tons, a decrease of 1,393,000 tons compared with 1888. Quotations, Free Burning, f.o.b.: Broken, \$3.85; Egg, and Chestnut, \$4; Stove, \$4.30.

The Bituminous Coal trade is somewhat improved, but there is no radical change. Supplies will be diminished by the floods, but no scarcity is apprehended. The Cumberland Coal shipments aggregate 56,000 tons, Tyrone and Clearfield 48,000. The scarcity of vessels continues.

The Philadelphia *Inquirer* says: “The new Lehigh and Wilkesbarre Coal Company's mine at South Wilkesbarre will be started up on June 3. It is expected to be one of the largest producers in the region.”

Coxe Bros. & Co. are putting down a large colliery in the Schuylkill region, near Green Mountain.

The Pennsylvania Railroad Company announced a reduction in tolls on Buckwheat Coal and Culm to New York Harbor of 10¢ a ton, which will go into effect on June 21. The total reduction on these sizes is now 50¢ below domestic sizes.

Imports.

Hardware, Machinery, &c.

Almgvist, A. W., Mach'y, cs., 54
Barbour Bros. & Co., Mach'y, pkgs., 14
Baker, Hermann & Co., Chains, cks., 37; Arms, cs., 52
Field, Alfred & Co., Mdse, cs., 23
Godfrey, Chas. J., Arms, cs., 18
Graef Cutlery Co., Cutlery, cs., 6
Hartley & Graham, Mdse., cs., 12
Lundborg, G. G., Iron-ware, bxs., 8
Lau, J. H. & Co., Mdse., cs., 4
Lewis & Conger, Knife Machines, cs., 5
Mereh. Desp. Co., Mach'y, cs., 14; Arms, cs., 4
Morris, L. W. & Son, Mach'y, case, 1
Outerbridge, A. E. & Co., Propeller, 1; Brass Tube, 1
Schoverling, Daly & Gales, Arms, cs., 3
Sacks & Richmond, Nails, cks., 4
Taylor, Thos., Mdse., cs., 5
Tate, Muller & Co., Mach'y, case, 1
Wiebusch & Hilger, Lim., Mdse., cs., 60
Witte, J. G. & Bro., Cutlery, cs., 4; Guns, cs., 7

Walter S. Ottinger, of the Cambria Works, says that “John Fulton, general manager of the Cambria Iron Works, who is drowned, was one of the best men that ever lived. As an engineer he was superb, and as a Christian no man was purer or better. He could handle men as well as any other man in Pennsylvania.” Charles T. Butler, assistant cashier, and John S. Buchanan, superintendent of the warehouses, are also among the victims.

Machinery that is intended to revolutionize the present mode of propelling boats is now being built for a boat of about 300 tons register that lies at the foot of Twentieth street, Brooklyn. The inventor, Dr. Jackson, says he is spending \$10,000 a week in perfecting his ideas. Much secrecy is maintained, but it is said that the force to be used is hydraulic. The Worthington Pump Company are building a steam pump for the boat, but they have been delayed, it is said, by finding that ordinary metals are not strong enough to resist the pressure that will be exerted. They, however, have decided to try cast steel. It is alleged that the builders expect to realize a speed of 30 miles an hour with ordinary vessels.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, JUNE 5, 1889.

Merchant-Bar Copper, while fluctuating somewhat irregularly in price, has ruled quite strong. Early in the week an advance was caused by reports that an agreement had been arrived at in Paris. This was followed by some reaction due to realizations, but subsequently prompt sold up to £41. 10/, and the market closes strong. The fact that only a moderate quantity out of the large stocks on hand is offered tends to sustain values, particularly for named brands. Large purchases of forwards are said to have been made privately. There is a report that the recent interviews between mining delegates were unpleasant, resulting in the refusal of some companies to enter a fresh combination. The sale is reported of 200 tons Montana Matte, terms private. Among other important transactions the past fortnight 600 tons Yellow Metal and 1000 tons India Sheets are reported.

The demand for Tin has improved, but prices have ruled irregular in the face of that fact and the decrease in visible supply. Sales of prompts have been made at as low as £91. At the Dutch sales 24,200 slabs Banca and 1000 Billiton sold at an average of £92. 15/ in Holland.

Tin-Plate has been in rather better demand the past week and heavy shipments to the States are reported. Prices are, however, no better. Two new mills are being added to the Vernon works.

Pig-Iron warrants have been firmer, and the “bears” are manifesting uneasiness. It is stated that large orders have been placed in the hands of brokers to purchase should prices further decline. High prices for Coke have increased the cost of production and will cause Cleveland furnaces to be damped unless rates advance. The masters are determined not to produce at a loss. One Tees firm has stopped deliveries of Bilbao Ores. Maker's brands of Scotch, while 6d to 1/6 lower than last week, have met with freer sale, as has also Middlesbrough at about 6d decline. Hematites are strong and more active also.

The effect of the Staffordshire combination is watched with considerable interest in Wales, where a similar organization may be formed. Welsh Bars are 2/6 up this week, but other Manufactured Iron is unchanged.

Steel of all descriptions continues strong, and prices generally are higher, including 2/6 advance on Rails and Blooms and 10/ rise on Wire Rods. Makers ask £6. 10/ upward for the latter.

High prices have been paid for Old Material during the week, and Rails are said to be scarce at the present time.

Scotch Pig.—There has been a more active business, but at irregular and rather lower prices.

No. 1 Coltness,	f.o.b. Glasgow	54/6
No. 1 Summerlee,	“	53/
No. 1 Gartsherrie,	“	51/9
No. 1 Langloan,	“	53/6
No. 1 Carnbroe,	“	46/
No. 1 Shotts,	at Leith	52/6
No. 1 Glengarnock,	Ardrossan	51/6
No. 1 Dalmellington,	“	45/
No. 1 Eglinton,	“	43/

Steamer freights, Glasgow to New York, 2/6; Liverpool to New York, 10/.

Cleveland Pig.—At a further reduction in prices there has been a larger trade and the market is firmer. No. 3 Middlesbrough, G.M.B., quoted 38, prompt.

Bessemer Pig.—Trade has been quite brisk and the market is decidedly firmer. West Coast brands, mixed numbers, 49/6, f.o.b. shipping point.

Spiegeleisen.—For this material there continues to be a firm and fairly active market. English 20 % quoted 82/6, f.o.b. at N. W. England shipping point.

Steel Rails.—The market strong at 2/6 advance, and the demand fairly active. Heavy sections quoted at £4. 15/, and light sections £5 @ £5. 2/6, f.o.b. at N. W. England shipping point.

Steel Blooms.—Makers ask 2/6 advance, but sales are not large. We quote £4. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—There has been a good business at slightly under previous nominal prices. Bessemer, 2½ x 2½ inch, £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—The market for these continues quiet but steady. Bessemer, £4. 2/6, f.o.b. at N. W. England shipping point.

Old Rails.—Demand only fair, but prices firm, owing to light stocks. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

Scrap-Iron.—A fair demand and prices steady. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—Business moderate and prices unchanged. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin-Plate.—The market has been rather more active, but prices show little change. We quote, f.o.b. Liverpool:

1C Charcoal, Allaway grade	15/3 @ 15/6
1C Bessemer Steel, Coke finish	13/6 @
1C Siemens	14/ @
1C Coke, B. V. grade	13/ @
Charcoal Terne, Dean grade	12/ @ 12/3

Manufactured Iron.—In this line there continues to be a fairly active trade at firmer prices. We quote, f.o.b. Liverpool:

Staff. Marked Bars	£ s. d.	£ s. d.
Common	8	2 6
Staff. Bl'k Sheet, singles	7	12 6
Welsh Bars (f.o.b. Wales)	5	5 0 @ 5 7 6

Copper.—The market fairly active and stronger, particularly for named brands. To-day's prices for Bars were £41. 10/, spot; £41. 5/, three months' futures. Best Selected, £47.

Tin.—A fair business done but at irregular and lower prices. Straits quoted to-day at £91, spot, and £91. 10/ for three months' futures.

Lead.—The market barely steady and rather slow. Quoted £12. 6/ for Soft Spanish.

Spelter.—There is less doing but prices remain firm. Quoted at £18 for ordinary Silesian.

Foreign Markets.

EQUIVALENTS.

Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	\$1.08
Milreis (Brazil)	54.6
Mark (Germany)	23.8
Kilogram	2.205
Picul	134.

GERMANY.

HAMBURG, May 25, 1889.—Iron.—The Rhinish-Westphalian Iron market displays great firmness. The gigantic coal miners' strike

took a good many iron works by surprise, their stock of coal being light, and several had to stop work in consequence for the moment. The effect on iron has if anything been a stiffening one. Some more blast-furnaces may be blown out, and this is all the more to be regretted, as both production and consumption of Pig-Iron has of late been very brisk. Stocks of the latter are reduced to 50,000 tons, showing that the larger production of the last few months has been absorbed. The largest reduction of stock has been in Forge Pig, but Foundry Pig has also been somewhat reduced; Thomas and Bessemer less so. All rolling-mill products and railroad material remain unaltered. The quotation for Wire-Rods is 110 @ 120 marks $\frac{1}{2}$ ton, and that of Steel Rails 120 @ 125 marks.—*Borsenhalle.*

BRAZIL.

PARA, May 28, 1889.—*India Rubber.*—Two steamers with together 269 tons of Rubber on board have just left for the United States, having absorbed all the available supply on the spot May 31. The total receipts in May at this port were 620 tons Fine and 680 tons Ordinary.—*Per cable direct.*

CHILI.

VALPARAISO, March 29, 1889.—*Copper.*—The news per cable of the collapse of the syndicate and of the decline to £35 in consequence thereof has put a stop to dealings for export here. At a similar figure Copper production would not leave a margin in this country. *Coal.*—Copious arrivals from Australia have caused a drop to 25/, while Newcastle on the spot is worth 34/6 and floats thereof are firmer. *Exchange.*—There has been quite a decline, to 26 $\frac{1}{2}$ d, 90 days' sight on London.—*Weber & Co.*

EAST INDIES.

SINGAPORE, April 23, 1889.—*Tin.*—Our last report was dated 9th inst. Only a moderate business has been done in the majority of our staples, and there are no signs of any increase in the near future. Financial difficulties in France have had a depressing effect on this metal, and the fortnight's business totals only 160 tons at prices ranging from \$35.80 to \$36.35 $\frac{1}{2}$ picul. Stocks are not large, and we hear of nothing that justifies any change in the estimated production for the year. The closing price is \$35.50 $\frac{1}{2}$ picul with buyers. During the first quarter there were shipped from the Straits Settlements to the United States 31,523 piculs of Tin, against 10,014 tons during the corresponding period of 1888; 23,954 in 1887; 15,471 in 1886; 8406 in 1885, and 15,724 in 1884. Since then the steamer Prometheus took hence for New York 3785 piculs and the Ganges 3788. *Gum Copal.*—Continues firm, partly because there is a fair demand for good quality, but chiefly because prices are not yet at the level that will induce a large holder to make contracts. There have been no arrivals to speak of. *Gum Damar.*—Nothing has been done beyond a few small sales of low quality. Palembang has changed hands for Continental requirements. Very little of this article now comes to Singapore. *Tonnage.*—Rates are weaker and we look for some future decline shortly. Room offers freely for next month's shipment, but for this month's loading 37/6 for dead-weight is the best practicable so far. *New York via Cape.*—No change. News is just at hand of the loss of the Norway. *For Boston* the Obed Baxter has sailed. *Exchange.*—Is steady at 3/1 $\frac{1}{2}$ for six months' sight credit drafts.—*Gilfillan, Wood & Co.*

MANILA, May 27, 1889.—*Hemp.*—There are buyers at \$14.50 $\frac{1}{2}$ picul, against \$8.37 $\frac{1}{2}$ same date last year, equaling $\frac{1}{2}$ ton, cost and freight, £46. 10/, against £28. 5/6. Since last cable there were no clearances for the United States, against 6000 bales last year; since January 1, 109,000 bales, against 76,000; there remain loading for the United States, 23,000, against 15,000; cleared for England since January 1, 107,000 bales, against 134,000; loading for ditto, 14,000, against 8000; cleared for all other ports, 18,000, against 34,000; receipts at all ports since last cable, 6000, against 22,000; ditto since January 1, 251,000 bales, against 249,000 in 1888 and 188,000 in 1887. *Freight.*—\$7.50, against \$5.50. *Exchange.*—Six months' sight, 3/5, against 3/5.—*Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street.*

RUSSIA.

ST. PETERSBURG, May 23, 1889.—*Petroleum.*—The Government has at length taken a favorable view of the pipe line which a private company propose to lay for Naptha conveyance between the Caspian and Black Seas. The cost of it is estimated at 30,000,000 rubles, and the Government has been petitioned by the company to guarantee 3% per annum interest on a bond issue to be made of 14,000,000 rubles,

but the Finance Minister is opposed to this guarantee, but even without the latter the line will be laid.—*Journal de St. Petersburg.*

Teal's Portable Hoist.

The Committee on Science and the Arts of the Franklin Institute, Philadelphia, submitted a report on May 1 relative to Teal's portable hoist, from which we take the following extracts:

There are several well-known differential hoists in the market, but they all differ widely from Teal's invention. In all other hoists known to us, the overhauling or lowering of the hook is a mere reversing of the hoisting action and requires the same time as to lift a load, there being in them no provision for applying power to any other part of the hoist than that by means of the hand-chain by which the lifting is done.

The Teal hoist, on the contrary, has a slow and powerful motion to lift its load by means of the hand-chain and a quick movement for overhauling the chain and lowering the hook for a second lift by a pull directly upon the lift-chain. Supposing the convenient velocity in pulling the two chains to be the same, then in the 1000-pound hoist examined by us the hook can be overhauled five times faster by a pull upon one side of the lift-chain, or six and seven-tenths faster by pulling on the other side, than it can be by the hand-chain. This increases the capacity and usefulness of the hoist, and is therefore a valuable improvement.

The extent of this improvement is shown in a table which gives the velocity ratio and overhauling speed of several well-known hoists, with the ratio of increase in the Teal hoist. The general arrangement and workmanship of the hoist is good. The journals are made self-oiling by having a chamber filled with fibrous packing combined with each journal, and while we think some parts of the malleable-iron framing could be with advantage increased in weight and strength, we regard it as, upon the whole, an excellent hoist, with such novelty and advantage as fully entitle it to receive an award from the committee. The results of the tests made by the committee are given in such a manner as to enable a comparison to be easily made with those obtained by the committee appointed by the judges of group No. 136 of the Novelties Exhibition of 1885 on portable hand-hoists. In view of the very high efficiency of the hoist, showing a considerable increase over the best one then tested, and in view of the increase of capacity and speed in overhauling, the committee recommend the award of the John Scott legacy premium and medal to Chas. A. Teal for his invention.

Selling Galvanized Iron by Weight.

A week ago, says *The Metal Worker*, we indulged in a little editorial musing in the Roofing and Cornice Department concerning the practice of designating galvanized iron by gauge and the many objections there are to this system of describing sheets. We pointed out that sheet-copper is sold according to weight per square foot, and that, therefore, the roofer or cornice-maker who employs the latter material knows exactly what amount of surface a certain number of pounds of copper will cover, while if it were galvanized iron that was used for the purpose the amount could not be accurately determined. The weight of galvanized sheet per square foot has no fixed relation to the gauge under which it is sold, the reason being that the commercial gauge marks themselves are only a roughly approximate designation of thickness. The evil arising from the present indefinite system of marking is not confined to

mere annoyance, but often amounts to an actual financial loss on a contract, due to mistakes in estimating the quantity of material needed. The suggested remedy was very simple, and consisted in adopting the practice of selling galvanized iron by weight, the same as sheet-copper. We did not expect to see our advice followed immediately, for hitherto we have had to wait a long time before any effort was made toward changes that we had suggested. In the present instance, however, we have been agreeably disappointed, for, as will be seen by this week's advertisement of a prominent metal-house, any one in need of galvanized iron is enabled to buy sheets that are guaranteed not to exceed a given weight per square foot. Under this system the manufacturer has only to determine the superficial area of his work and to decide upon the thickness of the iron he wishes to use (which is given both in wire gauge and decimals of an inch), when by means of the table furnished by the dealer he can readily calculate the number of pounds of galvanized sheet-iron required. We are well satisfied that this innovation will commend itself to the trade, and, furthermore, we believe that the practice will in time be followed by other supply-houses and rolling-mills until selling galvanized sheets by weight becomes the common system.

Joints in Cast-Iron Pipe.

The attention given not long ago to the testing of soil-pipes brought to notice the methods employed for making joints between sections of cast-iron pipe. The two joints in most common use are the calked lead and rust joints, the former being the popular one in plumbing-work. When the pipe, from any cause, is subject to considerable variations of temperature the lead joint is liable to become leaky through the unequal expansion and contraction of the two metals. Never mind how tight the ring of lead is driven into the hub, the irresistible force of heat will in time loosen it and break the hermetic seal. This objection is overcome by packing the joint with iron filings wetted with water or some corrosive liquid that by its rusting action expands the filling and makes a close and permanent joint. The reasons that the latter method is not more often followed are the difficulty of properly preparing the cementing material and the fact that pipes so joined cannot be separated without breaking. The rust joint is permanent in the last degree, so permanent, indeed, that a sledge-hammer is the readiest instrument with which to effect its disarticulation. It seems strange that the inventive genius of the age has not better solved the problem of cast-iron-pipe joints, and that people are still confined in their choice between what may be tersely described as an imperfect method and an impracticable method. So long as the cast-iron pipes are made in their present form the joints will have to be filled with a cementing material of some sort. A filling of possible usefulness for this purpose is referred to by one of our foreign exchanges in describing a new method of making a joint between rough surfaces of cast-iron. The cement is simply mineral asbestos mixed with white lead to the consistency of a stiff putty, and has been successfully employed for closing cracks in cast-iron gas retorts. This compound, besides making a tight and permanent joint, will, it is said, resist any amount of heat, and is unaffected by steam or water. Let it be understood that we do not recommend plumbers to use this asbestos cement without trial, but simply tell them what is told us, and they in turn may do what they please with the information.

Hardware.

Trade continues in fair to moderate volume, and is perhaps about as good as can be expected at this season. Business through the country is in general prosperous, and a hopeful tone pervades the trade in regard to fall business. Prices are not strong, but there are few changes.

Cut Nails.

The consumption of Nails is quite heavy, and the leading houses are doing a good business. The curtailment of production referred to last week has been carried still further since then by the forced suspension of operations at factories in Central Pennsylvania which have been flooded by the great rise in the Susquehanna River. Buyers here who have been getting their supply from that section are somewhat anxious and are seeking to cover their immediate requirements from other sources. Advantage has not been taken of this circumstance to raise prices, but it seems altogether likely that if the Central Pennsylvania supply should be cut off for any length of time prices will go up naturally. The Oxford Nail factory is again running but only temporarily, and will shut down as soon as its stock of Plate is consumed and will then await developments. Iron Nails are still quoted at \$1.80 to \$1.90, according to quantity.

Export Trade.

The condition of the export trade remains about the same as last month; good orders continue to arrive from the Argentine Republic and the last mail from the Australian Colonies was a shade better than those received in April and May. Latest advices from Melbourne state that orders will be held back as much as possible until freight rates are more favorable. At the present time, however, rates are firm, and there seems to be considerable doubt as to the weakness promised. Freighters are in a peculiar situation; vessels they must have, and they are obliged to charge their customers high rates and run the chance of driving away business or reduce rates lower than charter and lose money. At present rates freight is scarce, for Melbourne and Sydney particularly, and heavy shipments of lumber and oil to fill vessels are the results. This means loss to freighters at present state of market in the colonies. Melbourne has 100,000 cases of oil on hand; Sydney, say, 90,000, not taking into account heavy shipments to arrive. The lumber market in Melbourne is reported as fair, while Sydney is dull. A great deal of interest is being taken by the American manufacturers in the export business, and new lines are rapidly being introduced into the Argentine and Australian colonies. The American manufacturer cannot be accused of non-activity or lack of enterprise in seeking foreign markets; he has had remarkable patience and has passed through trials and tribulations without number. In order to get his goods introduced a lot of money has been invested in catalogues, export journals with little or no circulation in markets where his goods could be sold, in contributions to pay expenses of travelers to foreign markets, and in consignments for which no return has ever been made, and in other fruitless ways.

Wire Nails.

We give below the new Wire Nail card, June 1, 1889, in the form in which it has been adopted by the manufacturers. It will be observed that it covers the Standard Nails and also the Shelf goods. In accordance with the outline of the plan, as referred to in our last issue, it will be observed that the object sought to be accom-

plished by the manufacturers in this new arrangement, which is so important a departure from former methods, is to have a system by which Nails of any regular size or kind may be sold at a single base price. The card has accordingly been so arranged as to cover by its advances the increased cost of the different goods, so that it will apply to any and all goods described in it. Another object in adopting this scheme has been to reduce the assortment of the goods regularly sold under the miscellaneous list, a selection having been made of such gauges as in the judgment of the manufacturers were the most desirable for the trade in general. This is expected to result to the advantage of the manufacturer in diminishing the number of sizes to be manufactured and carried in stock, while the selection made is considered as suitable for the merchant and tending to discourage the carrying of several gauges of Nails of the same kind and length. Nails not described in the card are to be sold at special net prices. The manner in which the card is proportioned to the cost of the goods is intended to remove the temptation to cut on certain goods, the extras on which much exceeded the increase in their cost. It will thus be seen that the extras on some of the leading sizes, which were unreasonably low, have been increased, while on the smaller sizes, which were held at unnecessarily high prices, they have been very materially reduced. The following is the new card:

WIRE-NAIL CARD.

WIRE NAILS [IN KEGS] JUNE 1, 1889.

60d Common, Base.....

Common Fence, Shingle, Flooring and Common Brads.

60d.....base.
Extras.

50d.....\$0.10

30d and 40d... .20

20d......30

12d and 16d... .35

10d......40

8d and 9d......50

6d and 7d......65

4d and 5d......90

3d.....1.50

2d.....2.00

Barbed Common and Barbed Car Nails.

25 cents advance over common.

Casing and Smooth Boz.

30d and 40d...\$0.60

20d......70

12d and 16d... .80

10d......90

8d and 9d....1.00

6d and 7d....1.25

4d and 5d....1.50

3d.....1.75

2d.....2.25

Barbed Box, 25 cents advance over smooth.

Smooth Finishing Nails.

2d.....\$2.50

3d.....2.00

4d.....1.75

Lining Nails.

Extras.

$\frac{3}{4}$ in.....\$3.50

$\frac{1}{2}$ in.....3.00

1 in.....2.50

Barrel.

$\frac{3}{4}$ in.....\$3.00

$\frac{1}{2}$ in.....2.50

1 in.....2.00

$\frac{1}{4}$ in.....1.75

$\frac{1}{2}$ in.....1.50

$\frac{1}{4}$ in.....1.25

$\frac{1}{2}$ in......90

Slating.

2d.....\$2.00

3d.....1.25

4d.....1.00

5d......90

Tobacco.

4d and 5d....\$1.00

6d and 7d.... .75

8d and 9d.... .60

10d......50

Barbed Roofing.

$\frac{3}{4}$ in.....\$3.00

$\frac{1}{2}$ in.....2.50

1 in.....2.00

$\frac{1}{4}$ in.....1.50

$\frac{1}{2}$ in.....1.25

$\frac{1}{4}$ in.....1.00

2 in......90

Clinch Nails.

2d.....\$3.00

3d.....2.00

4d and 5d....1.50

6d and 7d....1.00

8d and 9d.... .90

10d......75

12d and 16d... .60

20d......50

Wire Spikes.

All sizes.....\$0.50

Hinge Nails.

4d.....\$1.75

6d.....1.50

8d.....1.25

10d.....1.00

12d to 16d.... .90

20d......75

SHELF GOODS, WIRE NAILS—PRICES STATED ARE FOR 1-POUND PAPERS.

For Nails in 25 and 50 pound boxes bulk deduct 25 cents per 100 pounds.

For Nails in 100-pound kegs deduct 50 cents per 100 pounds.

For Nails in $\frac{1}{4}$ -pound packages add \$1 per 100 pounds.

For Nails in $\frac{1}{2}$ -pound packages add \$2 per 100 pounds.

60d Common, standard.....Base.....

Fine Finishing Nails.

Gauge. Extras.

$\frac{3}{4}$ in..(20)...\$11.50

$\frac{1}{2}$ in..(20)...9.50

$\frac{1}{4}$ in..(19)...7.50

$\frac{1}{4}$ in..(19)...6.00

$\frac{1}{4}$ in..(18)...5.00

1 in..(18)...4.50

$\frac{1}{4}$ in..(17)...4.00

$\frac{1}{4}$ in..(17)...3.75

$\frac{1}{4}$ in..(16)...3.25

$\frac{1}{4}$ in..(15)...3.25

2 in..(14)...3.00

$\frac{1}{4}$ in..(14)...3.00

$\frac{1}{4}$ in..(13)...2.75

$\frac{1}{4}$ in..(12)...2.50

$\frac{1}{4}$ in..(12)...2.50

3 in..(12)...2.50

Fine Brads.

$\frac{3}{4}$ in..(19)...9.50

$\frac{1}{2}$ in..(19)...8.50

$\frac{1}{4}$ in..(18)...6.50

$\frac{1}{4}$ in..(18)...5.50

$\frac{1}{4}$ in..(17)...4.50

1 in..(17)...4.00

$\frac{1}{4}$ in..(16)...4.00

$\frac{1}{4}$ in..(15)...3.00

$\frac{1}{4}$ in..(14)...3.00

2 in..(13)...2.75

$\frac{1}{4}$ in..(13)...2.75

$\frac{1}{4}$ in..(12)...2.50

$\frac{1}{4}$ in..(11)...2.50

3 in..(11)...2.40

Trunk Nails. Oval or Flat Heads.

$\frac{3}{4}$ in..(20)...\$11.50

$\frac{1}{2}$ in..(19)...8.00

$\frac{1}{4}$ in..(18)...6.50

$\frac{1}{4}$ in..(16)...4.50

$\frac{1}{4}$ in..(16)...4.25

1 in..(15)...3.50

$\frac{1}{4}$ in..(15)...3.25

$\frac{1}{4}$ in..(14)...3.10

$\frac{1}{4}$ in..(14)...3.10

$\frac{1}{4}$ in..(14)...2.85

$\frac{1}{4}$ in..(13)...2.85

2 in..(13)...2.75

$\frac{1}{4}$ in..(12)...2.75

$\frac{1}{4}$ in..(11)...2.50

All Barbed Nails 25 cents advance over smooth.

All special Nails at special prices.

The objects of the manufacturers in adopting the above card are clearly explained in the following circular, which has been issued by the Cincinnati Wire Company, Cincinnati, Ohio:

The advantage of this list to the dealer over the old method of quoting will be appreciated at a glance. It does away with a great many gauges for which there was little or no sale; it also does away with the miscellaneous list. It covers all standard stock sizes. Any length or gauge of Nail not on this list will be regarded a special Nail to be made to order at a special net price.

Under this list all Nails of every description in any size package will be quoted on the one base price of 6d common. Each length and gauge of Nail is put under its proper head, so that in ordering it will not be necessary to state any gauge, but simply to state the kind of Nail and length or penny.

Each size in this list is rated according to its relative cost above the base size, and there will therefore be no cutting of classification.

The HP Nail Company, Cleveland, Ohio, send out the new card with this explanatory circular:

At a meeting held in Cleveland, Ohio, May 28, to take into consideration the changing of

the Wire-Nail price list, 90 per cent. of the Wire-Nail capacity of this country was represented, and voted unanimously to adopt the new list, as presented, to go into effect June 1, 1889. Great care has been taken in making this change. The aim of this new price-list is to sell each Nail (as near as possible) on a basis of its cost. The former base Nails have been advanced, and the high advance Nails have been reduced. The miscellaneous list (which was subject to discount) has been abolished. All Nails on this new price-list are sold from the same base price, with advances added. Special Nails not found in this list will be subject to special prices. We feel satisfied that this change will be as satisfactory to the buyer as to the manufacturers. There are no good reasons why you should have any more sizes of Wire Nails to carry than Cut Nails.

As showing the value of Nails under the new as compared with the old card, we have received the following figures, which relate to an actual retail assortment of the standard goods on hand at the time of the change. The base price is put in both cases at \$2.75. It will be seen that there is with this assortment, which is not entirely symmetrical, very little difference in the aggregate value under the new and the old cards:

No. kegs.	Nails.	Old card.	New card.
1	2d fine.....	\$6.25	\$5.25
7	3d fine.....	40.25	33.25
5	2d fine.....	27.50	23.75
2	3d.....	9.50	8.50
13	4d.....	48.75	47.45
6	5d.....	22.50	21.90
45	6d.....	155.25	153.00
4	7d.....	13.80	13.60
66	8d.....	204.60	214.50
5	9d.....	15.50	16.25
27	10d.....	78.50	85.05
3	12d.....	8.25	9.30
3	16d.....	8.25	9.30
5	20d.....	13.75	15.25
2	30d.....	5.50	5.90
2	40d.....	5.50	5.90
2	50d.....	6.20	5.70
2	60d.....	6.20	5.50
200		\$675.85	\$679.85

We are not informed that any action was taken by the manufacturers in regard to the base price, as in the present condition of the market it would not probably be feasible to secure entire agreement upon this point. We understand, however, that the purpose of the manufacturers is that the base price which has for some time been ruling be adhered to.

Miscellaneous Prices.

In sympathy with the Copper market the prices of Plumbers' and Steam and Gas Fitters' Brass-Work are slightly lower, and are not characterized by entire uniformity.

Agricultural Wrenches are held firmly at the lately slightly advanced prices, and are quoted regularly at discount 80 per cent.

The Lead manufacturers held a meeting in this city last Friday and made a small advance on Sheet and Pipe Lead, the new quotations being, Sheet, 64¢, and Pipe, 6¢. The condition of the Lead market was the cause of this change, and it is not unlikely that Shot will soon follow.

The Hazard Powder Company, 97 Randolph street, Chicago, Ill., issue a circular relating to Shot-Gun Cartridges loaded to their order with Hazard Powder, and send also a price-list. A discount of 40 and 10 per cent. is quoted, with extra discounts for quantities named.

In his advertisement on page 113, C. E. Hudson, Leominster, Mass., calls attention to his line of Apple-Parers for the coming season. The name of his Hudson '88 has been change to the Daisy. The following revised quotations on Apple-Parers, which, it will be observed, are lower than prevailed last year, are made by him:

Little Star, per dozen.....	\$4.25
Rocking Table, per dozen.....	5.50

Relief for the Sufferers.

The Hardware Board of Trade, 4 and 6 Warren street, New York, are receiving subscriptions for the relief of the sufferers by the disaster in Johnstown and vicinity. Those reported to the hour of going to press are as follows:

New York Belting and Packing Co.....	\$500.00
Wallace & Sons.....	100.00
Thomas Kenworthy.....	100.00
Wiebusch & Hilger.....	50.00
Schoverling, Daly & Gales.....	50.00
Alfred Field & Co.....	50.00
Henry B. Newhall Co.....	50.00
Maltby, Henley & Co.....	50.00
Hermann Boker & Co.....	50.00
Topping & Fox.....	50.00
F. & W. Clatworthy.....	25.00
McCoy & Sanders.....	25.00
A. B. & W. T. Westervelt.....	10.00
O. Lindemann & Co.....	10.00
Bayles Bros.....	10.00
William Bishop.....	5.00

This list, it is hoped, will be largely increased, but it should be borne in mind that many Hardware houses have contributed to the same object, which makes so strong an appeal to the sympathy and liberality of all, through other channels.

Trade Topics.

With reference to the position of Los Angeles, Cal., and the feeling of opposition on the part of its merchants to Pacific Coast agencies with headquarters at San Francisco, a matter to which we alluded in a recent issue, we have the following from a well-known Hardware house of that city, and our correspondents refer also, it will be observed, to Los Angeles as a business center:

The time has been when exclusive agencies were the rule in many lines and located at San Francisco, notably Farm Implements and Tools. We have occasionally, when asking for prices from Eastern manufacturers, been courteously referred to "our exclusive agent" at San Francisco. We have uniformly replied that the markets of San Francisco and Los Angeles are as distinctly two markets as are the markets of Portland, Me., and Charleston, S. C., and that we should pay no percentage to coast exclusive agencies. The real-estate boom having departed from this city and section, we have now settled down to legitimate business. Our city and country can boast of steady advances in population, reasonable activity in building and improving, and the outlook is good. We have a rich country, and we think there can be no question as to the probability of a successful future for our trade.

The fraternity of commercial travelers who are endeavoring to induce the railroad companies to adopt an interchangeable 5000-mile ticket at 2 cents per mile, are hoping that their efforts will be attended with success, especially as they are aided by the co-operation of merchants and manufacturers in some leading cities. The principal difficulty in the way is the apprehension of the railroad companies that the tickets would fall into the hands of scalpers, and thus be diverted from their intended exclusive use by the travelers to whom they are issued. If assurances could be given to the railroad companies that this would not be the case there would be little doubt but the tickets would be promptly and cheerfully furnished.

In reply to the inquiry which appeared in our last issue from an Alabama Hardware man as to the proper place on boxes to mark cost and selling price—front, side or bottom—we have the following succinct and pointed advice from a prominent New England merchant:

Do not mark the cost or selling price on the box. In buying stock select a line and stick to it. Put the boxes the maker puts the goods into on the shelves. Sample nothing unless it is under glass. Buy Root's lists and use them. To say more is to waste your time and space.

Merchants are often annoyed by having business in their town given to outside parties, and where the outsider is in a position to supply the goods or do the work better or on more advantageous terms there

is of course no good reason for complaint, but sometimes the home merchant is compelled to see the contract given to outside parties without any such justification. This matter is referred to by a correspondent in the West, who alludes to it in this way:

I had a conversation with a steam-fitter about keeping trade in his own town. He stated that on public work preference always seemed to be given to outsiders, and mentioned one job on which he was required to give bonds to twice the amount of the job, and to agree to accept a small cash payment on the completion of the work and the balance in six months. The job was awarded to a man from an adjoining city, who received cash on completion of the job at the same figures.

This was probably an exceptional case, as local pride and the public spirit of each town are usually on the side of its own merchants, and we happened to have advice by the same mail in regard to a job in the same vicinity as that referred to, in which the merchant who resided in the adjoining town was informed that unless his figures were very much below those of their local concern the contract would be kept at home, as they desired to avoid sending the money out of town.

Items.

A catalogue showing remarkable care and skill in its compilation has just been issued by Horton, Gilmore, McWilliams & Co., Chicago, Ill., and in it there are a number of features which are new and commendable. It opens with a title-page which is reproduced in the advertisement of the house on page 87, after which is a page devoted to what they call "Our Pick-up Department," which contains the mottoes "Quick Delivery," "Complete Shipments," "No Substitution," "Bottom Prices," and gives illustrations to emphasize their readiness to pick up for their customers any outside goods which can be found in the city and their facilities for doing the same, with the suggestive intimation that everything can be found in the Chicago market that is worth having. The volume is given a formal introduction in a letter to the trade in *fac-simile* of the handwriting of James M. Horton, the president. This catalogue derives special interest from the fact that it is the first which has ever been issued by the house, and illustrates the energy and enterprise of its present management. It is a volume of 1190 pages and represents an exceedingly complete line of Hardware and related goods. It opens with Mechanics' Tools and passes on to Agricultural Tools, including Steel Goods, Rakes, Shovels, Post-Hole Diggers, &c. Builders' Hardware, covering a large variety of staple and special goods, next follows, after which the department devoted to Cutlery is reached, which opens with illustrations of the Revolving Show-Cases which are given to customers who purchase the company's goods when a line of Table Cutlery, miscellaneous Knives, Pocket Cutlery, Sheep Shears, &c., is shown. The department devoted to Revolvers, Guns, Ammunition, &c., follows, with the related goods in the way of Fishing-Tackle, Bicycles, Velocipedes, &c. Tin Ware, Pieced, Stamped and Japanned, is represented in suitable variety and with very satisfactory cuts. Many other goods in this department are shown, and also Tinsmiths' Tools, Machines and Supplies, Refrigerators and many miscellaneous articles. Near the end of the volume are such staple goods as Tacks, Nails, Screws, Bolts, Horseshoes, Metals, &c., and it closes with Spectacles, Clocks, an interesting variety of such oxidized silver goods as Shoe-Horns, Bonbonieres, Pins, Match Safes, Vinaigrettes, Book-Marks, Glove-Buttoners, Button-Hooks, Letter-Openers, Paper-Knives, &c. The volume is well printed, conveniently arranged and fully illustrated. It will be sent to cus-

tomers with the first goods ordered, and is not, we are advised, for sale.

L. W. Ferdinand & Co., Boston, Mass., have issued a convenient illustrated catalogue of 130 pages, in which prominent place is given to the manufactures of the Shelton Brass Hardware Company, for whom they are agents. The list thus represents an extensive line of Heavy and Ship Chandlery Hardware, Tackle Blocks, Cordage, &c., and will be found convenient and serviceable as giving a desirable assortment of these goods. Several specialties are illustrated which are of interest.

T. Seloff & Co., Detroit, Mich., successors to McCutcheon & Hanford, dealers in Hardware, Stoves, Hot-Air Furnaces, &c., 57 Grand River avenue, have recently purchased a fine brick building at 787 Grand River avenue, and have about completed its equipment. This firm are, we are advised, the Detroit agents for Sayre, Owens & Co., manufacturers of the Union, Oneida and Tubular Hot-Air Furnaces, Utica, N. Y.

In connection with the formal notice of the disposal of the stock of goods and goodwill of the business of Caruth & Byrnes Hardware Company to the Simmons Hardware Company, St. Louis, Mo., a more personal announcement is made by David W. Caruth, president of the former company. It is in the following graceful and appropriate terms:

MY DEAR FRIENDS: Owing to physical infirmities, increasing with years, I have found it necessary for me to be relieved as far as possible from the cares of active business. This has induced me, and through me the Caruth & Byrnes Hardware Company, of which I am president, to go out of active business. To accomplish this end with satisfaction to ourselves and with due regard to the welfare and interests of our many patrons and friends, we have this day transferred our stock of goods to the Simmons Hardware Company, of St. Louis, which concern has thus become our successors. I personally desire to express to you all my warmest friendship, and at the same time to thank you cordially not only for your liberal patronage, but especially for the very friendly business and personal favors extended to us in the past. I shall be most happy to meet any of you at any time (for I shall remain in St. Louis). Our office will be with Simmons Hardware Company, at which place I shall make my headquarters to adjust and settle up the old business of our company and where I shall be glad to welcome you.

In the description given in our issue May 23 of the Sash Lock and Ventilator manufactured by Jenkins & Timby, Oswego, N. Y., and 102 Chambers street, New York, the cut illustrating it was inadvertently placed upside down, thus rendering less clear and satisfactory the description and perhaps puzzling those who did not give careful attention to it. Our readers will please note the correction, and it may be worth their while to look again at the description, that they may get a clear idea of the construction and merit of the Sash Lock and Ventilator. They will be able to do this very readily by reference to the advertisement in this issue on page 93, in which a very clear illustration of the article is given. The manufacture of this article is attended to by I. G. Jenkins, Oswego, N. Y., while its sale is attended to by T. F. Timby, 102 Chambers street, New York.

James E. Colby, a traveling salesman for the wholesale Hardware firm of Markley, Alling & Co., has disappeared, and the members of the firm apprehend that he has been foully dealt with. His territory was through Iowa. When last heard of he was at Neola, May 11. His employers have made liberal use of the telegraph wires, but nothing can be learned of him. He is not known to have had any enemies, and is well liked by the men on the road. Mr. Colby is about 27 years old and wears a heavy dark mustache. He is a native of Toronto, Ont. Members

of the firm think he engaged a team to drive to a point in the country and was "held up" by highwaymen. While out of Chicago Mr. Colby made Des Moines his headquarters.

Hibbard, Spencer, Bartlett & Co., Chicago, Ill., issue a price-list of Fire-Works, in which many illustrations are given showing the display secured by the different articles, and thus of special interest as including many novelties, as well as staple Fire-Works. A number of assortments of Fire-Works, in cases, are also given, with the value of the goods at retail prices and their list-price, which is subject to discount. A number of Pistols and related goods are also included in the catalogue.

E. C. Meacham Arms Company, St. Louis, Mo., issued under date May 24 another of their price-currents representing their unusually complete assortment of Arms, Ammunition, &c. Their discount sheet is attached.

Morley Bros., East Saginaw, Mich., issue a circular calling attention to the Letter Opener, of which we recently gave a description, and which they are putting on the market. The advantages of this device and the manner in which it does its work are alluded to.

The Niagara Stamping and Tool Company, Buffalo, N. Y., issue a large sheet illustrating a varied line of goods in which supplies for canning factories are given a prominent place, and the completeness of their assortment of these goods is emphasized. It will be of interest to many in the trade as relating to Machines and articles which are not often found in catalogues.

Wells Bros. & Co., Greenfield, Mass., issue a neat catalogue devoted exclusively to Stratton Bros' Improved Spirit Levels, of which they are now the sole manufacturers.

J. H. Martin & Co., 143 Water street, St. Johns, N. F., issue a sporting catalogue relating to Fishing Tackle, Cricket Goods, Guns, Ammunition, &c., in which an interesting assortment of goods in these lines is represented, with prices. They also call attention to the fact that their principal business is Shelf and Heavy Hardware and general House-Furnishing Goods, full lines of which are kept in stock.

James E. Halsey, who is widely known to Hardware men from his long connection with the trade, especially in the South, will represent the Electric Cutlery Company, 91 Chambers street, New York, in the Southern States, selling their Electric Razors and Cutlery, Lamont and Electric Razor-Strops, &c.

Butts & Ordway, 145 Pearl street, Boston, Mass., announce that they have added to their stock a line of Builders' Hardware, and allude to the favorable terms on which they are offering the goods.

Exports.

PER BARK HARRIET S. JACKSON, MAY 18, 1889, FOR EAST LONDON, SOUTH AFRICA.

By W. H. Crossman & Bro.—6 dozen Hatchets, 20 crates Stoves, 3 cases Carriage Hardware, 68 packages Carriage-Ware, 300 dozen Hatchets, 5 dozen Hatchets, 5 dozen Axes, 120 dozen Brooms, 3 dozen Churns, 3 dozen Clocks, 15 dozen Traps, 50 dozen Handles, 7000 pounds Nails, 10 Lawn Sprinklers, 94 packages Stoves, 18 Scales, 5750 pounds Sash Weights, 155 pounds Sash Cord, 6 dozen Hatchets, 30 dozen Brooms, 1820 pounds Sash Weights, 2 dozen Sash Cord, 5 dozen Wash-Boards, 3 dozen Tables, 10 dozen Traps, 1 dozen Clocks, 52 cases Stoves, 504 Plooms, 608 Flows.

By Coombs, Crosby & Eddy.—7 Flows.

PER BARK G. M. STANWOOD, MAY 20, 1889, FOR FREEMANTLE, AUSTRALIA.

By Winchester Repeating Arms Co.—36 Guns, 30,000 Metallic Cartridges.

By Mailler & Quereau.—1 case Guns.

y R. W. Forbes & Son.—6 packages Hardware, 174 dozen Axe and Pick Handles, 1 gross Blacking, 600 pounds Axle Grease, 2 gross Shade Rollers, 2 dozen Store Trucks, 24 sets Axes, 1 case Horse Hoes, 3 cases Churns, 12 boxes Scales, 35 dozen Axes, 6 dozen Axes, 8 dozen Fork Handles.

By Arkell & Douglas.—54 cases Edge Tools, 16 cases Edge Tools, 12 cases Handles, 36 dozen Shade Rollers, 6 dozen Traps, 1 dozen Wringers, 8 cases Axle Grease, 6 cases Spokes, 17 bundles Felloes, 14 bundles Wash-Boards, 3 cases Axes, 12 boxes Clothes-Pins, 4 crates Rolling-Pins, 22 cases Hardware, 9 cases Edge Tools, 7 cases Handles, 4 racks Churns, 12 dozen Wash-Boards, 1 case Brooms, 2 cases Perambulators, 14 cases Meat-Cutters, 2 cases Toys, 15 cases Hardware, 13 cases Edge Tools, 12 dozen Forks, 6 boxes Clocks, 4 cases Hardware.

By H. W. Peabody & Co.—9 cases Hardware, 3 dozen Wash-Boards, 12 cases Hardware, 4 packages Dairy Implements, 2 gross Brooms, 11 cases Edge Tools, 20 dozen Brooms, 22 cases Hardware, 11 cases Fire-Arms, 24 dozen Wash-Boards, 1 case Toys, 24 dozen Shade Rollers, 1 case Pumps, 2 dozen Churns, 192 dozen Handles, 6 cases Axes, 33 packages Carriage-Ware, 1 case Agricultural Implements, 1 case Scales, 1 case Carriages, 32 packages Hardware, 1 case Skates, 1 case Dairy Implements, 2 packages Whips, 7 packages Agricultural Implements, 2 cases Harness, 190 dozen Blacking, 3 Refrigerators, 8 cases Fire-Arms, 5 cases Clocks, 409 pounds Bolts, 300 pounds Fuse, 50 feet Hose, 1 case Blocks, 3 cases Bolts, 11 cases Hardware, 1000 Handles, 6 cases Fire-Arms, 2 cases Wringers, 2 cases Clocks, 2 cases Perambulators, 1 case Wringers, 1 case Pumps, 9 cases Hardware, 4 cases Fire-Arms, 24 dozen Handles, 3 dozen Churns, 1 case Freezers, 6750 pounds Twine, 1 case Emery Goods, 36 dozen Handles.

PER BARK MATHEW BAIRD, MAY 24, 1889, FOR PORT NATAL, SOUTH AFRICA.

By R. W. Forbes & Son.—7 cases School Slates, 22 packages Scrapers.

By H. W. Peabody & Co.—100 dozen Handles and Brooms, 1 case Stamped-Ware, 8 cases Hardware, 79 packages Agricultural Implements, 12 dozen Wash-Boards.

By Corner Bros. & Co.—110 dozen Tools, 80 cases Hardware.

By W. H. Crossman & Bro.—120 dozen Brooms, 20 dozen Wash-Boards, 5 dozen Axes, 60 dozen Pick-Axes, 16 dozen Axes, 192 dozen Handles, 1 case Hardware, 15 dozen Curry-Combs, 1/2 dozen Churns, 1 dozen Shellers, 1 dozen Store Trucks, 3 Refrigerators.

PER BRIG NETTIE, MAY 24, 1889, FOR AUCKLAND, NEW ZEALAND.

By Arkell & Douglas.—2 crates Handles, 2 cases Hardware, 1 case Saws, 1/2 dozen Mangles, 2 cases Nails, 1 case Wringers, 11,200 pounds Barb Wire, 5 cases Edge Tools, 3 dozen Ox Bows, 170 pounds Bolts and Nuts, 60 boxes Horse Nails, 2 cases Hammers, 28 cases Handles, 4 dozen Springs, 6 cases Hardware, 10 dozen Handles, 3 cases Edge Tools, 3 cases Saws, 2 cases Hammers, 2 cases Wringers, 8 cases Traps, 500 Broom Handles, 6 dozen Rakes, 1 1/2 dozen Churns, 2 cases Bench Screws, 3 cases Shade Rollers, 1 case Nails.

By H. W. Peabody & Co.—10 cases Hardware, 5 cases Agricultural Implements, 14 packages Hardware, 13 cases Stone, 400 feet Belting, 13 packages Churns, 4 cases Fire-Arms, 1 case Castings, 52 packages Hardware, 2 cases Castings, 3 cases Pumps, 170 dozen Handles, 16 packages Agricultural Implements, 20 packages Lawn Mowers, 21 packages Churns, 1000 feet Rubber Hose, 950 pounds Nails, 3 crates Sewing-Machines, 1 package Indicators, 5 tons Barb Wire, 20 packages Agricultural Machinery, 1 case Hardware.

By F. B. Wheeler & Co.—3 1/2 dozen Wringers, 18 dozen Axes, 6 gross Axle Grease, 6 dozen Axes, 1 dozen Axes, 24 dozen Handles, 1/2 gross Axle Grease, 2 dozen Axes, 24 dozen Handles, 1 case Clocks.

By A. S. Lascelles & Co.—2240 pounds Barb Wire, 1 box Wagons, 4 boxes Lawn Mowers, 10 dozen Rakes, 4 crates Wagons, 1 box Cutlery, 1 crate Churns, 2 cases Plated-Ware, 1 dozen Oil Cans, 1 1/2 gross Clocks.

By Welsh & Lea.—12 cases Handles, 5 cases Iron Bolts, 1 case Carpet Sweepers, 3 cases Saws, 9 cases Hardware.

By Morris, Strouse & Co.—20 1/2 gross Fruit Jars.

By Geo. W. Sillcox.—25 packages Sewing-Machines.

By H. B. Moore.—400 pounds Refrigerators.

By R. W. Forbes & Son.—36 dozen Axes.

By Mailler & Quereau.—14 packages Reapers, 3 packages Cultivators, 10 cases Scales, 29 cases Handles, 2850 pounds Axes, 60 kegs Nails, 4 cases Wheels.

By *Coombs, Crosby & Eddy*.—6 Pumps, 78 dozen Wood Handles, 4 dozen Bench-Screws, 2 dozen Wringers, 9 Pumps, 6 dozen Rakes, 6 Lawn Mowers, 5½ dozen Tin-Ware, 22 dozen Axes, 4 dozen Grindstone Fixtures, 123 dozen Hardware, 17 Tools, 8 dozen Hammers, 4 dozen Bird-Cages, 11 Meat Choppers, 96 dozen Tacks, 2 dozen Axes, 6½ gross House-Furnishing Goods, 1 dozen Hay Knives, 1 gross Whetstones, 2 dozen Wrenches, 2½ dozen Churns.

By *R. W. Forbes & Son*.—45 packages Blacking, 44 packages Sewing-Machines, 69 packages Blacking, 12 boxes Hardware, 2 packages Hardware, 1 box Plated-Ware, 1 case Plated-Ware, 1 case Lamp-Ware, 10 packages Churns, 36 packages Fruit-Jars, 2 cases Hardware, 1 gross Fly-Traps, 30 dozen Rakes, 20 dozen Snaths, 13 dozen Wrenches, 2 dozen Washers, 1 case Grinding Mills, 1 case Shade Fixtures, 1 case Rubber Goods, 17 packages Hardware, 5 packages Planters, 13 packages Agricultural Implements, 20 boxes Lawn Mowers, 30 dozen Spade-Handles, 4 cases Wringers, 100 dozen Axe-Handles.

By *W. H. Crossman & Bro.*.—36 dozen Axes, 11,300 pounds Barb Wire, 37 gross Fruit-Jars, 6 dozen Hatchets, 50 Toy Pistols, 5 packages Plated-Ware, 25 cases Skates, 32 gross Fruit-Jars, 2 dozen Wringers, 30 dozen Wash-Boards, 30 boxes Clothes-Pins, 1 case Ox-Bows, 600 feet Rubber, 1 case Lamp Goods, 1200 pounds Horse-Nails, ½ dozen Hay-Knives, 3 cases and 46 bundles Carriage-Ware, ½ dozen Lawn Mowers, 3 dozen Axes, 8 dozen Hatchets, 10 dozen Axes, 2 dozen Dashers, 3 dozen Traps, 1 dozen Wringers, 12 dozen Egg-Beaters, 2 cases Hardware, 3 cases Hardware.

FOR NELSON.

By *Arkell & Douglas*.—3600 Cartridges.

By *H. W. Peabody & Co.*.—44,800 pounds Barb Wire, 240 dozen Handles.

By *R. W. Forbes & Son*.—8 packages Hardware, 2 packages Hardware, 2 crates Butter-Workers, 60,000 Caps, 1 case Miter Boxes, 1 box Pumps, 9 packages Stoves, 1 package Rubber Springs, 9 Emery Wheels, 1 case Lampware, 2 gross Shade-Rollers, 11,250 pounds Barb Wire, 180 dozen Axe-Handles, 40 dozen Wash-Boards.

By *McLean Bros. & Rigg*.—500 Handles, ½ dozen Augers, 1 gross Axle-Grease, 8 dozen Axes, 1 gross Shade-Rollers, 8 gross Lead-Pencils, 1 dozen Bird-Cages, 1 dozen Wringers, 10 dozen Wringers, 4 gross Cotton Lines, 3 dozen Mallets, 2 dozen Cast-Iron Sinks, 4 dozen Lanterns, 1 dozen Dashers, 1½ dozen Churns, 336 pounds Tacks, 9000 Cartridges, 12 dozen Handles, 1 case Castings, 9 gross Fruit-Jars, 2 Drills, 3 cases Assorted Hardware, 12 dozen Wash-Boards, 3 dozen Mop-Sticks, 4 packages Lamp Goods, 8 Lawn-Mowers, 1 case Hardware, 3 cases Hardware, 6 dozen Mattocks, 3 cases Hardware, 12 cases Hardware, 10 Butter-Workers, 48 dozen Handles, 6 dozen Wash-Boards, 22 Stoves, 12 gross Clothes-Pins, 3 packages Stove Fittings.

PER BARK OLE SMITH PLONG, MAY 25, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

By *Coombs, Crosby & Eddy*.—24 Plows, 24 pounds Sash-Cord, 6 Plows, 36 Plowshares, 34 dozen Edge Tools, 1152 pounds Sash-Weights, 20 dozen Axes, 40 dozen Hatchets, 3 cases Plows, 60 Ladders, 2 cases Carriages, 9 Carriages, 3 cases Harness, 4 cases House-Furnishing Goods, 40 dozen Edge Tools, 5 cases Bird-Cages.

By *Corner Bros. & Co.*.—97 cases Hardware.

By *R. W. Forbes & Son*.—6 dozen Axes, 40 dozen Pick-Handles.

By *H. W. Peabody & Co.*.—16,000 pounds Nails, 6 bundles Carriage-Ware, 3 cases Hardware, 2 cases Pumps, 204 dozen Handles, 10 kegs Nails.

By *J. Norton & Sons*.—11 packages Power Threshers.

Outside Lines.

From advices received it is evident that the Hardware business in England is in an unsettled condition and unsatisfactory in some respects, especially as regards the encroachment by merchants in other lines upon Hardware territory. Complaints are frequently made that the business of regular iron-mongers is seriously interfered with by the co-operative stores, dry goods merchants and others, and the question is coming up as to what shall be done to correct this condition of things. The *Ironmonger*, of London, is agitating the question, and under the head of "Opportunities of the Trade" refers to the matter in this way, asking, it will be observed, a free expression of opinion on the subject:

It is held in many quarters that there are excellent opportunities for iron-mongers to embark in other industries, which they could

carry on as aids to and feeders of their iron-mongery branches. It is urged, indeed, that as the drapers have invaded the domain of the iron-mongers and as the "general dealers" also cut several classes of iron-mongery, therefore iron-mongers ought to "go in" for other branches. Some of the new departures suggested are:

Jewelry,
Fancy Goods,
Furniture,
Cycles,
Basket-Ware,
Sewing-Machines,
Clocks and Bronzes,
Oils and Colors, &c.,
Drapery,

Guns, Pistols, Rifles, &c.
Paper-Hanging and Decorating,
Engineering Work,
Grocery,
Gas and Water Fittings,
Glass and China,
Stationery and Books,

and so on. Some of these branches, we are well aware, are already carried on by many iron-mongers. Cycles, Oils and Colors, Guns, Rifles, &c., Plumbing and Gas-fitting, and a certain amount of engineering work already find places in the establishments of some iron-mongers; but the other trades indicated above, with many more which might be named, are generally considered to be "out of the way" of iron-mongers. There may or may not be good reasons why they should remain untouched by the trade, and in order to elicit the views of our readers we invite them to discuss the matter fully in our columns. They may say what they like in their letters, but it will serve to direct the correspondence into useful channels if we formulate the following series of questions:

1. What is the most profitable "outside" branch of trade in which an iron-monger can engage?

2. What experience, if any, have you yourself had of carrying on any branch of business other than iron-mongery proper? Answer this question as fully as possible if you are in a position to answer it at all.

3. State your arguments clearly for and against an iron-monger embarking in any branch outside his own trade.

4. If an iron-monger does start an outside branch, what, in your opinion, are the leading principles by which he should be guided?

It is hoped that this discussion may be interesting and profitable to the trade at large. There is certainly plenty of good material for it in existence.

There is, fortunately, in this country a much better condition of things prevailing, and Hardware merchants are permitted to carry on their business with much less interference from outside lines. There is, however, to be observed a certain tendency toward the breaking down of the lines which have separated the different kinds of trade, and there is some reason to apprehend that there will be in the struggle for business an increasing disposition to do this.

Arrangement of Stores.

From P. C. Benn, with Willis D. Thompson, Concord, N. H., we have a description of the Belting case shown in the illustration, Fig. 346. It is divided, as indicated, into compartments for the reception of the different sizes of Belting, the compartments being ½ to 1 inch larger than the width of the Belting for which

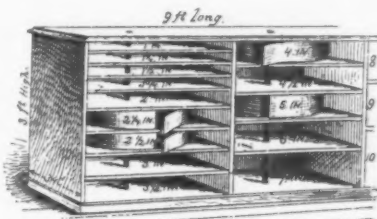


Fig. 346.—Belting Case.

they are designed, a feature which permits the easy insertion of the rolls. Iron rods are run through the middle of these sections of the case for the purpose of holding the rolls of Belting in the places provided for them while any required length is being cut off. It will thus be seen that by simply drawing out the rod any roll can be put in or withdrawn without disturbing the other sizes. The top of the case can be utilized as a counter. Mr. Benn remarks that this case has been in use for the past 15 years, alluding to it as placed

at the rear end of the store, the floor being marked off every 5 or 10 feet to facilitate measuring. The utility of this arrangement will be recognized by the trade.

This rack, Fig. 347, is in use by Hibbard, Spencer, Bartlett & Co., of Chicago, for the purpose of displaying samples of Stove Boards in their house-furnishing department. It is constructed mainly of 2½-inch strips, 1 inch thick, and is put together with screws, so that it can be

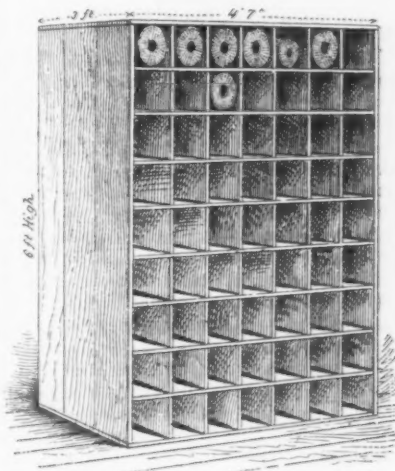


Fig. 347.—Wire-Cloth Rack.

taken down at the close of the season and packed away in small space. The Stove Boards stand on a ledge on the bottom and central strips, there being room for two tiers on each side of the rack. The cross pieces are close enough together to hold the smallest sizes of Boards as well as the large ones.

The accompanying illustration, Fig. 348, is a representation of a new and compact Wire-Cloth rack in use in the Chicago sales-room of the Gilbert & Bennett Mfg.

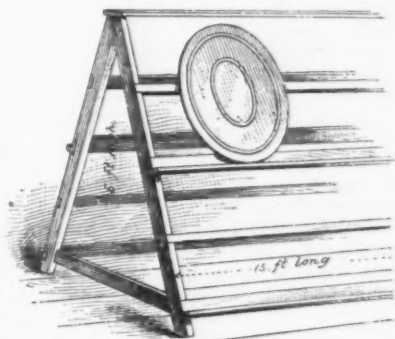


Fig. 348.—Stove-Board Rack.

Company, 148 Lake street. It is intended to hold 63 rolls, embracing a full assortment of widths and colors, up to 3 feet. It stands on the floor and extends to the height of 6 feet 1 inch. It is constructed of white pine, the horizontal pieces being inch boards and the uprights ¾-inch boards. The pigeon-holes are 7 inches square in the clear, which has been found to be about the right size to accommodate Wire Cloth. Above each roll is painted the width and color, as, for instance, "24, drab." A salesman is thus able to lay his hand at once on a desired roll, without pulling a number of them out to see which is the right one. The rack is open front and back, so that it can be used from either point of approach.

The Samoan difficulties are believed to have been definitely settled. The protocol drawn up by the conference at Berlin will be signed next Saturday.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

The interest of manufacturers of White Lead and of jobbers in painters' supplies generally continues to center upon the pending deal between the White Lead Trust and prominent Western manufacturers, who, as yet, do not seem to have come to terms. The trust officials say practically that the Collier and the Southern companies have signified a willingness to enter the trust, and intimate that the matter of cash consideration is the only point upon which there is any disagreement. Whatever the facts in this particular may be, it is certain that both companies are still among the "independents" and that the trust is not the power it seeks to be so long as the Collier, the Southern, the Eckstein and the Atlantic companies retain their individuality. The best authorities figure out that the trust now controls very little more than, if quite, 50 per cent. of the entire capacity; and there is some doubt that, should the companies named remain independent until the new Standard White Lead Company gets well under way, the balance of power in the White Lead business will be within the trust. The Standard Company intend to manufacture Lead by a new process, and there is a belief that the concern will be independent of the White Lead Manufacturers' Association as well as anti-trust. New England jobbers appear dissatisfied with existing rebates as given by the association and hint that a New England combination, with mills controlled by jobbers, is a thing of the near future. The uncertainties and possibilities of the future are, however, having no pronounced effect upon the market at the present time. There is a good average business doing, at all events, and former prices and rebates prevail. Crude materials and Linseed Oil are higher and impart an additional firmness to prices of Leads.

After business hours on the Stock Exchange sales of Lead Trust certificates were reported at as high as 28½, and the rumor had circulation that either the Collier or the Southern or both companies had been finally absorbed by the trust.

Zinc White has continued to meet with fairly satisfactory sale. Orders do not run very large at the moment, but what is lacking in size is nearly compensated for in number, and enough stock is moved to enable manufacturers to keep prices very steady. American sells at from 4½¢ for common up to 4½¢ for prime, and foreign at the prices and rebates current for some time past.

In Colors there has been no movement that differs materially from what is customary at this season of the year. The staple articles in dry form move steadily at practically unchanged prices, both from first and second hands. Colors in Oil also meet with satisfactory movement as a rule, and the trade in Ready-Mixed Paints is generally represented as ahead of that for the corresponding period last year.

Miscellaneous articles, embracing Barytes, Chalk, Terra Alba, Talc, Whiting, &c., have undergone no change of importance. The movement is of average volume and prices generally are steady.

Oils.

In most lines of animal and vegetable Oils business has been rather smaller than during the preceding week. Some improvement is noticeable the last few days, however, and the general distribution seems to be quite on a level with the average for this season of the year.

Linseed Oil has been advanced 1¢, as foreshadowed last week. The combination and the outside crushers found the action equally agreeable in view of the position of the Seed market, and unless there is a change in the latter nothing short of an extensive use of substitutes for Linseed Oil will prevent a further advance before the end of the month. City crushers now quote 60¢ for Raw and 63¢ for Boiled. Western Raw is about 58¢ here or at near-by points.

In Cotton-Seed Oils there has been no change the past week. Trust officers, as usual, have nothing to report, and the information derived from other sources indicates merely a fair business at steady prices.

Lard Oil has just about held its own in price and met with a steady sale in fair-sized lots, the bulk of business being in present make prime. About 56¢ for City and 55¢ for Western are the general figures.

Sperm and Whale Oils have undergone no change in value, and the market is without new feature apart from some increase in sales of crude Sperm in the East. A moderate quantity of crude Menhaden Oil has been sold for export, but prices for both crude and manufactured Oils remain about the same as quoted last week. Olive Oil in barrels is weaker, having been sold at as low as 65¢, at which price it is understood round lots can still be obtained. Up to 67½¢ is, however, quoted for jobbing quantities. In other Oils there has been merely the routine business, and prices remain almost exactly the same as quoted last week. A good-sized lot of Western Saponified Oil has been sold at 4½¢ during the week.

Wholesale Prices.

Paints, Oils, &c.

NEW YORK, June 5, 1889.

Oils.

Linseed, City, raw.....per gal	60	@	..
" " "boiled.....	63	@	..
" " "Western, raw.....	58	@	59
Lard, City, Extra Winter.....	..	@	60
" " "Prime, present make.....	..	@	56
" " "Extra No. 1.....	52	@	54
" " "No. 1.....	45	@	45
" " "Western, prime.....	55	@	..
Cotton-seed, Crude, prime.....	39	@	40
" " "off grades.....	33	@	39
" " "Summer Yellow, prime.....	49	@	50
" " "off grades.....	46	@	48
Sperm, Crude.....	70	@	72
" " "Natural Spring.....	70	@	72
" " "Bleached Spring.....	75	@	77
" " "Natural Winter.....	76	@	78
" " "Bleached Winter.....	81	@	83
Whale, Crude.....	..	@	46
" " "Natural Winter.....	..	@	73
" " "Bleached Winter.....	..	@	48
" " "Extra Bleached.....	..	@	50
See Elephant, Bleached Winter.....	54	@	55
Menhaden, Crude, Sound.....	28	@	30
" " "Crude, Southern.....	33	@	34
" " "Light Pressed.....	33	@	34
" " "Bleached Winter.....	..	@	38
" " "Extra Bleached.....	..	@	41
Tallow, City, prime.....	..	@	51
" " "Western, prime.....	49	@	50
Cocoonut, Ceylon.....	54	@	54
" " "Cochin.....	54	@	54
Cod, Domestic.....	34	@	35
" " "Foreign.....	35	@	36
Red Elaine.....	36	@	38
Red Saponified.....	44	@	5
Bank.....	30	@	31
Straits.....	31	@	32
Olive, Italian, bbls.....	65	@	67½
Seatsfoot, prime.....	62½	@	75
Palm, prime, Lagos.....	54	@	..

Paints and Colors.

Barytes, Prime White.....	12.50	@	20
" " "off-color.....	12.50	@	14
" " "Foreign floated.....	19	@	21
Blue, Celestial.....	54	@	54
" " "Chinese.....	20	@	35
" " "Ultramarine.....	7	@	25
Brown, Spanish.....	3	@	1
" " "Vandyke, American.....	3	@	3½
Black, American Drop.....	8	@	10
" " "English.....	12	@	14
" " "Frankfort.....	25	@	30

Black, Lamp, common.....	12	@	18
" " "medium.....	19	@	25
" " "prime.....	27	@	33
Carmine, No. 49, in bulk.....	3.10	@	..
" " "in boxes or barrels.....	3.20	@	..
" " "in ounce bottles.....	4.20	@	..
Chalk.....	3.25	@	3.50
China Clay, English.....	13.50	@	18
" " "Southern.....	10.00	@	11.50
Cobalt, English.....	2.00	@	2.90
Crocus Martius, English.....	1½	@	2½
" " "American.....	1½	@	2½
Green, Paris, in bulk.....	20	@	..
" " "170 to 175 lb kegs.....	20½	@	..
" " "small packages.....	22	@	26½
" " "Chrome, ordinary.....	8	@	11
" " "extra.....	12	@	13
" " "pure.....	22	@	25
Lead, American White, dry.....	6½	@	7
" " "in oil.....	7	@	7½
" " "Red.....	6½	@	7
Litharge, in casks.....	6½	@	..
" " "500-lb lots.....	7	@	..
" " "smaller.....	7½	@	..
Ocher, Rochelle.....	1.37½	@	1.50
" " "Bermuda Single Washed.....	1½	@	1½
" " "Double Washed.....	1½	@	1½
" " "Floated.....	1½	@	1½
Orange Mineral, English.....	8½	@	9½
" " "French.....	9	@	9½
" " "German.....	8½	@	9½
" " "American.....	8	@	8½
Paris White, English Clifstone.....	1.00	@	1.10
" " "American.....	70	@	85
Red, Indian, English.....	5½	@	7
" " "American.....	2	@	6
" " "Turkey.....	0	@	14
" " "Tuscan.....	9½	@	11
" " "Venetian, American.....	90	@	1.25
" " "English.....	1.00	@	1.50
Sienna, Italian, Burnt and Powd.....	5	@	6½
" " "Lumps.....	1½	@	3½
" " "Raw, Powdered.....	5	@	6½
" " "Lumps.....	2	@	3½
" " "American, Raw.....	1½	@	1½
" " "Burnt and Powdered.....	1½	@	1½
Talc, French.....	14	@	14
" " "American.....	1	@	1½
Terra Alba, French.....	75	@	80
" " "English.....	80	@	85
" " "American No. 1.....	70	@	75
" " "American No. 2.....	38	@	40
Umber, Turkey, Bnt. and Powd.....	3½	@	4
" " "Burnt, Lumps.....	2½	@	3
" " "Raw and Powdered.....	3½	@	4
" " "Raw, Lumps.....	2½	@	3½
" " "Burnt, American.....	1½	@	1½
" " "Raw.....	1½	@	1½
Yellow, Chrome.....	10	@	25
Vermilion, American, Lead.....	11½	@	13
" " "Quicksilver.....	60	@	65
" " "English Imported.....	82	@	85
" " "Imitation English.....	8	@	25
" " "Trieste.....	75	@	77
" " "Chinese.....	88	@	90
Whiting, Common.....	47½	@	55
" " "Gilders.....	60	@	70
Zinc, American, dry.....	44	@	49½
" " "French, Red Seal.....	64	@	..
" " "Green Seal.....	74	@	..
" " "Antwerp.....	..	@	64
" " "in Poppy Oil, G. Seal.....	104	@	104½
" " "French, in Poppy Oil, Red Seal.....	8½	@	9½
" " "German, L. Z. O.....	5½	@	6

REBATES, &c.—White Lead, ½¢ per lb rebate on purchases of 500 lb and over, if paid for within 60 days of date of invoice; terms, 60 days or a discount of 2½% if payment within 15 days from date of invoice. Extra rebate of ½¢ per lb, payable July 1 and December 31 to buyers of a total of 10 tons pure Lead during the year.

French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1% ; 25 bbls, 2% ; 50 bbls, 4% . No discount allowed on less than 10 bbl. lots.

Paris Green.—Rebates to buyers of 500 to 1000 lb during season, ½¢ per lb; to buyers of 1000 to 2000 lb, 1¢; to buyers of 2000 to 4000 lb, 1½¢; to buyers of 4000 to 10,000 lb, 2¢; to buyers of 10,000 lb and over, 2½¢. Buyers of 5 tons or over at one time receive an additional ½¢ per lb.

Litharge.—Rebate of ½¢ per lb for cash in 60 days and 2½% additional for cash in 15 days.

The Canadian Pacific is a greater disturber of Chicago rates than the Grand Trunk. It carries grain by its line of steamers from that city to Port Arthur, and thence to Montreal, when it is shipped to foreign ports. These shipments are entirely free from any of the restrictions of the Interstate law, and the Canadian Pacific can make whatever charges it chooses, while American roads competing in the same foreign markets are hampered by the law. Under these circumstances it is impossible for the American roads to retain their share of the business of carrying Western grain to the sea-board. At the same time there is new and important competition with Chicago's grain trade at ports on Lake Superior, in which foreign and domestic roads are engaged. Lastly, a great deal of grain which formerly went to tide via Chicago now goes on lately-opened routes south of that city. All these facts help to unsettle Eastern-bound grain rates and to lessen the profits of railways on an important part of their traffic.

Allegheny's new pumping engines, made by the Wilson-Snyder Mfg. Company, have a combined capacity of 35,000,000 gallons daily.

The new harbor at Calais, France, was formally declared open by President Carnot on Monday.

Non-Friction Band-Saw Guide.

The three accompanying engravings show clearly the construction and application of a non-friction band-saw guide manufactured solely by Cross & Speirs, of Waterbury, Conn. The guide consists of a holder, in the top portion of which is fitted a sleeve, adjustable to and from the saw and held by a set-screw, and in which turns the shank of the wheel which forms a bearing for the back edge of the saw. In setting the guide, the back of the saw is made to bear a little harder on the upper edge of the disk, leaving a slight opening on the lower edge. The pressure of the work against the saw then makes its back bear securely against the disk. As the movement of the saw revolves the disk or

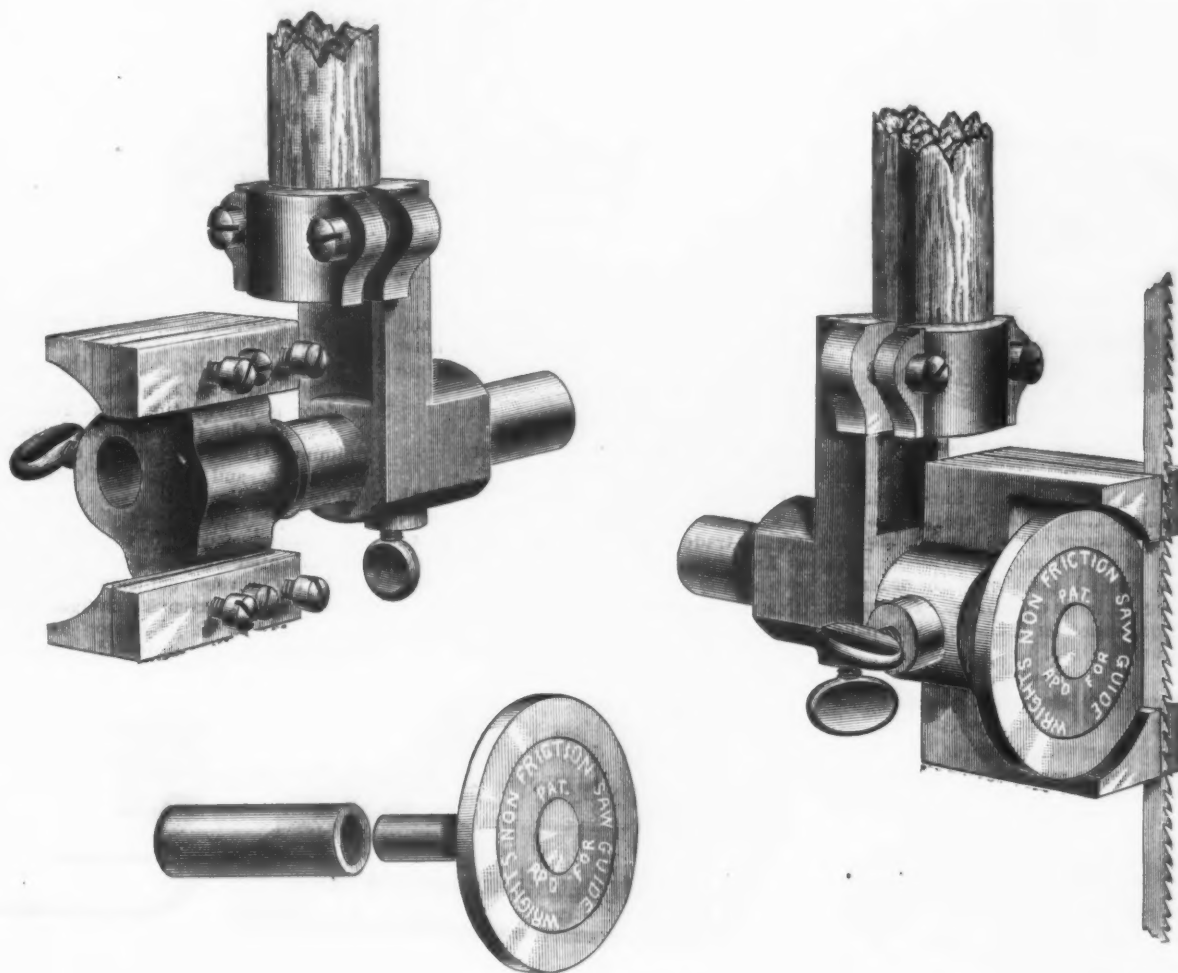
frivolous pretext. St. Nicholas Mole, which rumor says France seeks to acquire by treaty, is capable of being strongly defended and commands the channel between Hayti and Cuba. Most of the commerce of the Caribbean Sea from the United States goes through Crooked Island passage and past Nicholas Mole. As a naval depot the situation is fine.

A Hardware Drummer.

Not long ago a drummer for a hardware house started out. He was a giant in strength. He had two strong grips or hand-bags made, and in each he put up iron samples weighing about 185 pounds. He would alight from a train with his two

fellow would take hold of them with a smile and a firm grip, only to go down on the platform in defeat with a thump. Then he would rise, look at the grip, gaze at Smith awhile, then leave, muttering something about voodooism. Smith would then throw them into a wagon and go up to a hotel.

At the door he would call a bell-boy, and as he pushed his way through the crowd he would hand them to the poor, overworked boy, and the crowd would be astonished to see him go down with those grips, the fall making a noise that sounded like a freight-train wreck and shook the house. Smith would pick them up himself, and remark to the landlord that it was a shame to overwork his help in any such manner, and he would then walk



Wright's Non-Friction Band-Saw Guide.

wheel friction is done away with, and there is practically no wear at all. The wearing parts of the guide are made from hardened tool steel, and if kept properly oiled will last as long as the saw. The parts are so arranged that they can be adjusted easily to any width or thickness of saw, while the guide can be readily attached without injury to the machine. For resawing or heavy work it is preferable to have two guides, one above and one below the table, but for ordinary work one upper guide is sufficient, as it is so set as to take all the pressure. Testimonials received by the manufacturers indicate that the use of these guides has resulted in a great saving in saws, as the temper is preserved and the back edge is prevented from checking.

There are two much-coveted West India harbors, the Bay of Samana, in San Domingo, and St. Nicholas Mole, at Gonaïves, in Hayti. The former at one time was ceded to an American company, but the so-called concession was revoked on a

innocent-looking grips, and the hotel porter would make a rush for him.

"Right this way for the Hardcase House. Carry the grips up to the hotel, boss?"

"Yes," Smith would say—his name was Smith. He would then hand the two grips to that porter, and let go as soon as he saw the unsuspecting victim had hold of them. There would be a wild flourish of feet, a loud crash, and the porter would go down as if he had been shot.

"What are you throwing my grips around in that manner for?" Smith would yell, as if mad.

The porter would jump up, thinking he had stumbled, apologize, and make a grab at the grips. Then he would pull away until his suspender-straps would break, and would say: "B-b-boss, what are these things? I can't lift 'em."

Smith would take hold of them lightly, gently lift them up and say: "Oh, well, if you don't want to carry them I'll go to the other hotel."

Then, calling the other porter, he would give them to him. Of course, the other

toward the register, and the landlord would then rush up to him and say:

"Why, them boys are lazy. Here, give me your grips, sir," and he would take them.

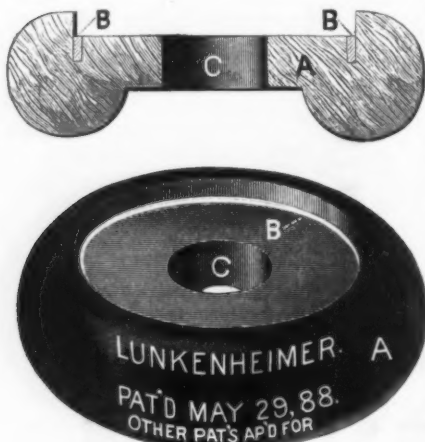
Of course Smith's remarks attracted all eyes, and as the landlord got a good hold of the handles Smith would let go suddenly. The spectators would be astonished to see the landlord's back suddenly hump itself like a cat on a back fence, his eyes bulge out like marbles on a mud wall, and then see him fall full length between those grips with a crash that brought people out across the way. He would get up slowly, rub his back, walk around the grips, and then go and swear, as Smith would take them up and put them on the counter.

Then the fun would begin. The clerk grabbed one of them to set it off the counter and it wouldn't move. He looked astonished, and then spit on his hands and tried to lift it, as his face turned red and knots swelled upon his forehead. But that grip wouldn't move. Then all the crowd would try their hand, and finally

all swear it was some trick. Smith would lift it off gently and ask them what ailed them. This would make the crowd feel his arms, and they found out he had muscles like rocks for hardness. Then it dawned on them that Smith had heavy grips for a sell, and they were correct.

An Unbreakable Wood Handle.

The annexed cuts show very clearly the construction of the Lunkenheimer wood handle, which is claimed to be unbreakable. The handle is bound by a seamless brass ring, B, about $\frac{1}{4}$ inch wide, imbedded in the under side of the handle and there held and concealed by the lower plate of

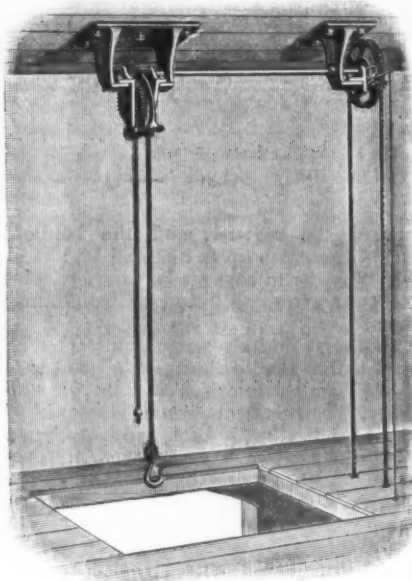


Lunkenheimer Wood Handle.

the handle, thus making it impossible for the handle to be pulled apart or split. The manufacturers of this handle, the advantages of which are self-evident, have prepared special machinery in order to turn it out in large quantities. It is made by the Lunkenheimer Brass Mfg. Company, of Cincinnati, Ohio.

Hatchway Hoisting-Machine.

We show herewith a simple and cheap hoisting-machine made in two sizes of 500 and 1000 pounds capacity by the Energy



Hatchway Hoisting-Machine.

Mfg. Company, of 1115 South Fifteenth street, Philadelphia. The hand-rope wheel-shaft is made any length, so that the hand rope is at one side of the hatchway, which is left clear for the load. This hoist is fitted with a double-acting brake, one sus-

taining the load at any point when hoisting, the other being used when lowering to control the speed. The load-rope does not wind around a drum, so the machine can be made much lighter than the old rope-wheel and drum; at the same time it

Anti-Friction Elevator-Door Hanger.

The construction of this door-hanger is extremely simple. It consists practically of but two parts, a frame, by means of which it is attached to the door, and a



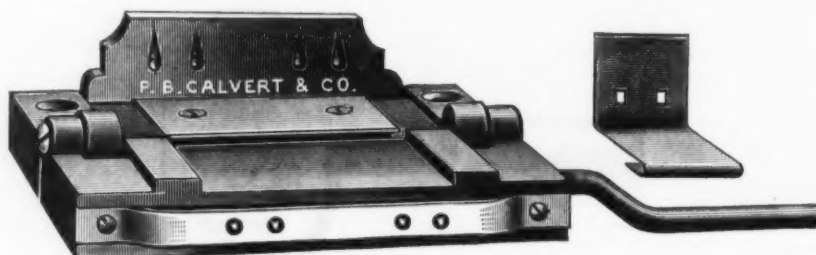
Anti-Friction Elevator-Door Hanger.

does the work with greater ease and rapidity. The manufacturers of this hoist state that they have a great number in use doing all kinds of work.

Enright's Cleat Former.

P. B. Calvert & Co., of 68 North Second street, Philadelphia, Pa., are offering the trade a convenient machine known as Enright's cleat former, a general view of which is afforded by the accompanying illustration. This machine is made of cast-iron, and weighs only about 5 pounds. It is so constructed that two cleats may

be formed at one operation, two holes being punched in each cleat, or one cleat may be formed without holes. A steel spring on the front of the leaf releases the cleat after it has been punched. At the right of the cut is shown a cleat already formed, the size being $1\frac{1}{4}$ inches. A careful inspection of the engraving which we present will enable those in the trade to readily understand the operation of this device.



Enright's Cleat Former, Built by P. B. Calvert & Co., Philadelphia.

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The Warwick Iron Company's furnace, at Pottstown, Pa., was blown out on the 28th ult. for a period of four or five months for repairs. This furnace has been in constant operation since December 15, 1885, with an output of 108,000 tons of iron. Some new improvements will also be added to the works.

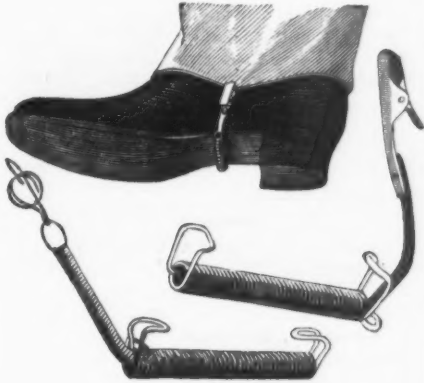
The Treasury Department has decided that certain imported barbed wire to which patent of domestic manufacture has been applied is not entitled to drawback under the law upon exportation.

That part of the apparatus which meets the eye is a sound-receiver made up of two narrow compartments, which are separated from each other by a partition. The receiver is capable of being rotated by the listener, who sits below, and the sounds reach his ear through separate tubes, each connected with one of the compartments. It is only when the receiver is pointed directly at the source of sound that the vibrations enter both ears. If an obstacle lies in the course of a vessel there is a reflex wave of sound obtained by echo.

The indifferent success of an English locomotive recently on trial in this country will be followed by a trial in England of a locomotive built in the United States. It is stated that the Pennsylvania Railroad has decided to send one of its best engines, perhaps "Long-legged No. 10." It will make its first appearance on the London and Northwestern Railroad. As the English railroads are much straighter than those in this country, railroad men are much interested to see what an American locomotive can do on a bee-line track.

For Horseback-Riders and Bicyclists.

This device, which is put on the market by Wendell M. Smith, Rochester, N. Y., and George T. Carter, Pittsburgh, Pa., is intended, as shown in the accompanying illustration, to hold the trousers down when riding a horse or bicycle, and is referred to as having advantages over the

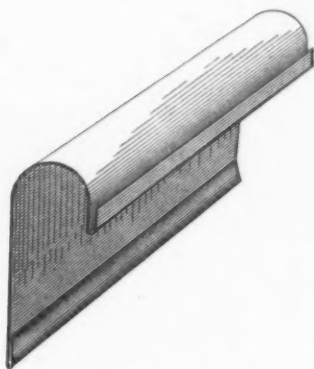


For Horseback-Riders and Bicyclists.

old method of straps and buckles, especially in the fact that it is complete in itself and can be attached or detached in an instant. As shown in the cut, the outside is made of wire coiled as in a spring with the ends bent into the form of hooks, so as to clasp the sole of the shoe firmly. A small leather band with a common metal clip on one end passes through the inside of the wire coil and is made fast to its outer end. For bicycle-riders the outside coil is exactly the same, but instead of the little leather strap a fine coil-spring is used, as shown also in the illustration. This is referred to as allowing the trousers legs to give when pedaling, and also prevents them from flapping against the wheels. As the metal clip is also likely to interfere with the wheel, attachment is made on the inside of the trousers leg by means of the spiral hook shown in the cut. When in use the device is concealed from the view of passers-by, does not change the ordinary appearance of the trousers, and when not in use can be carried in one's pocket. It is referred to as simple, durable, inexpensive and as having been thoroughly tested.

Former for Dipper Handles.

While factory-made dipper handles may be used to a certain extent, there are many shops where such articles are formed on



Former for Dipper Handle.—Fig. 1. General View.

the candle mold stake as of yore. The usual method of forming handles is by making bends near the edges by placing the tin on the stake and bending over by

means of the hand, then finishing the edge with the mallet. If a person had a hand whose width was equal to the length of a dipper handle this operation could be very quickly performed, but as the tin-

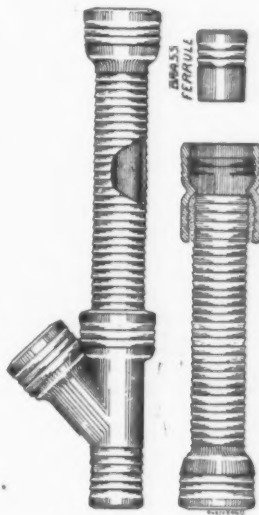


Fig. 2.—Shape of Handle After Coming from Former.

ner's hands are not the required width two or more movements are necessary to turn over each edge. A former as shown in Fig. 1 can be made from Russia iron that is very convenient for making the first bend when forming tubes similar to dipper handles. By holding the former in the left hand and slipping the edges of two or more handles in the bend A, then forming, and by treating the other edges in a similar manner, the handles are formed as shown in Fig. 2. The edges are then finished by means of the mallet, and the forming completed in the usual manner.

A New Kind of Soil-Pipe.

The Sanitary Soil Pipe Company, 100 West Sixth street, St. Paul, Minn., manufacture and sell Gleich Krause Company's patent soil-pipe, which is illustrated in the cut herewith presented. The main peculiarity of this pipe is the ribbed or serrated exterior surface, the principal advantages of which are that it permits a very tight joint to be made with the hub, and also allows the pipe to be broken readily at any point when in a stack or hanging in



A New Kind of Soil-Pipe.

the air. The sectional view through the hub shows the joint to be triple-wedge shaped, as the manufacturers describe it, and forming, they claim, a perfect protection against leaking, expansion, contraction or settling. As noted above, the principal advantage of the form, however, is to prevent splitting or cracking when the pipe is cut, the grooves being spaced $\frac{1}{4}$ inch. The pipe is said to have an attractive outside appearance, so that it is not necessary to cover it. What is of special interest at a time when particular attention is being given to the testing of soil-pipes is the statement of the manufacturers that this pipe has been repeatedly tested 500 pounds hydraulic pressure without any leak whatsoever. It is also pointed out that considerable saving of material is effected, because the pipe can be cut without splitting or breaking.

The brass ferrule shown in the illustration is for connecting lead waste and vent pipes with the soil-pipe. The manufacturers also allude to their trap covers, which are so constructed as to make a perfect airtight joint.

Broilers for Gasoline Stoves.

Harkins & Willis, of Ann Arbor, Mich., have placed upon the market what they are pleased to term Jim's Meat Broiler, designed for use in connection with gas or gasoline stoves. It is of simple construction and is designed to perform its work without drip or smoke and to require very little attention while in use. From an inspection of the cut presented here-



Broiler for Gasoline Stoves.

with it will be seen that the broiler consists of a metal surface perforated with holes, which are so punched as to keep the meat up from the iron plate. The holes are three-cornered, and the flange or burr on each side of the hole tends to keep the meat partially suspended while the heat circulates beneath and closes the pores. This action tends to retain the flavor and juices of the meat, while the peculiar formation of the apertures in the iron plate prevents all dripping. The center is slightly raised, causing the juices to run into the groove or swedge around the edge of the broiler. The arrangement is such that the manufacturers claim there is comparatively little smoke in operation, and that after broiling has been done the device is easily cleaned. It is claimed to be very rapid in operation and to give very satisfactory results.

E. L. Baker, United States Consul at Buenos Ayres, in a report to the Department of State, says that the cattle industry of the Argentine Republic is in such a languishing condition that a law has been passed offering a guarantee of 5 per cent. for ten years on the capital employed in the business of exporting fresh or preserved beef. The report says it is understood that several establishments are preparing to take advantage of the guarantee provided by the Government and are going into business on a large scale, with special steamers fitted up for the traffic and warehouses in England and France. Consul Baker is of the opinion that Argentine beef can never compete seriously with United States shippers unless improved methods are adopted in its preparation for market.

The harness manufacturers of this city and vicinity have organized to prevent the selling of goods by wholesale harness houses at retail prices.

Building Heavy Boilers on the Pacific.

The screw steamship *Australia*, of the Oceanic Steamship Company, of which J. D. Spreckels Bros. are the managing owners, says the *San Francisco Mining and Scientific Press*, has for the past two months been laid up for the purpose of converting her old machinery, which was on the compound principle, and using steam of 75 pounds pressure, into the modern system of triple expansion, using steam at 160 pounds above atmospheric pressure. The contract for the conversion was intrusted to the Risdon Iron and Locomotive Works, and is now rapidly approaching completion.

The boilers of the *Australia* are two in number, 14 feet 4 inches mean diameter, 16 feet 4½ inches long. Each boiler is fitted with six of Fox's corrugating furnaces 3 feet 4 inches mean diameter, 17-32 thick, having one fire-box common to each pair of through furnaces. The furnace fronts are flanged outward, thereby affording the means (which is highly essential) of hydraulic riveting. The back end of the furnace is flanged upward to take the tube-sheet (the latter is 29-32 thick), so that in the event of a furnace crown collapsing no difficulty arises in replacing the furnace, seeing that the furnace mouth is larger in diameter than the outside corrugation, and cutting at the back ends affords attachment for new furnace.

With the exception of tubes and braces, the boilers are constructed entirely of steel manufactured under the Siemens Martin process. The shell plating, which is 1½ inches thick, having tensile strength of 62,720 pounds, is built up of three courses, having two plates in each course. The longitudinal seams are fitted with butt straps inside and out and are treble-riveted, with the exception of end courses, which are double-riveted; the circular seams are also treble-riveted. With the exception of the forward end circumferential seam, the whole of the riveting on shell and ends is hydraulic riveting. The machine used for this purpose was built in San Francisco, and exerts a pressure upon the rivet of 150 tons to the square inch. Where practicable, the riveting of the fire-boxes is also hydraulic. The fire-box plating is composed of ½-inch plates, excepting bottom, which is ¾, and is single-riveted to tube-sheets. The plates forming the tops and sides of each fire-box are in one piece, so that only two plates form the outside of the box. The roof is efficiently supported by crossbars having braces screwed through the plate with nuts and washers inside. The sides are supported with braces screwed through the shell and also to each other. Each brace is protected with iron ferrules, in conformity with the United States Government requirements.

The flat part of the ends in the steam space are supported with wrought-iron braces 2½ inches in diameter, having plate-washers 10 inches in diameter outside, with nuts inside and outside. The tubes are 3½ inches external diameter, No. 8 thick; the number in each boiler, 616. Every alternate tube vertically and fourth horizontally is fitted as a stay screwed through the front and back tube-plates and beaded over at both ends, this plan having proved more efficient than that of fitting nuts, which are liable to burn away. These tubes are ¾ inch thick, and together with the plain tubes were expended by roller mandril. The whole of the plating is calked inside and out on the approved principle. The boilers have been constructed to conform to United States, Lloyds' Registry and British Board of Trade requirements for a working pressure of 160 pounds above the atmosphere. With this pressure it is estimated, with the

ample grate and heating surfaces provided, that the *Australia*, in ordinary work and with coal of average quality, will develop 2300 indicated horse-power, and this upon a coal consumption of 39½ tons per diem. The previous horse-power of the ship was 1800, with a consumption of 50 tons per diem. With the new machinery the ship is estimated to attain 13½ knots per hour. The heating surfaces are as follows:

Tubes.....	6814.2
Furnaces.....	482.5
Fire-boxes.....	316.4
Tube-plates.....	283.1

Total in two boilers.....	7896.2
Total fire-grate area in two boilers.....	234 sq. ft.
Ratio of heating surface to grate area.....	33.7:1

Each boiler is fitted with Cockburn's spring-loaded safety-valves—three to a set—and are 4½ inches diameter. All the valves can be eased from stoke-hold platform, and can be turned round while under steam. Main stop-valves, with brass internal steam-pipes, are provided on both boilers, 7 inches diameter, shutting off steam from engines and from each other. Surface, bottom, blow-off and drain cocks are also fitted together with a double set of water-gauges and test-cocks, having cocks at extremities of pipes on boilers. The main and donkey feeds enter at the after end of the boilers, and are so fitted that either valve can be overhauled while under steam. Internal pipes carrying the feed away from the furnaces over the tubes are also fitted. There is connection with non-return-valves on both boilers providing steam of reduced pressure into winch range.

As too much care cannot be exercised in raising steam in these high-pressure boilers, in order to reduce the possibility of leakage at bottoms to a minimum Clarke's patent circulators, with steam connection from winch boilers, are supplied. Steam jets for blowing tubes at sea or in port are fitted. The fire-doors are constructed on Martin's principle, and to the firemen are a great boon. They are perfectly balanced and open upward, so that a touch with the firing shovel is all that is required to open or close them, while in cleaning or slicing a fire they can be opened to the required height, and so prevent the intense heat from attacking the fireman, as is the case with the common swing-back door, which is a decided nuisance in a heavy sea. Ash-pit dampers and pricker-bars are fitted as usual. The fire-bars are of the ordinary type, in two lengths, supported on the ordinary dead-plate in front and on Tucker's patent bridge walls at back end. The smoke-stack is also fitted with a damper worked from stoke-hold platform. All the steam and feed pipes are of hammered copper, having spigoted flanges on the locomotive principle, and the flanges of steam-pipes are brazed and further secured with rivets. The boilers with their mountings in place have been subjected by hydrostatic test to a pressure of 320 pounds to the square inch (twice the working pressure) before leaving the works, and no evidence of weakness was discernible. The whole work proved to be perfectly staunch and water-tight.

Rapid Transportation for Letters, &c.—A large number of business men and scientists gathered at Boston last week to inspect and witness the performance of the pneumatic tube invented by John T. Williams, who was present to explain his new system of rapid transportation. Mr. Williams' plan is to erect a single-track elevated structure which is to carry a small car for the transportation of small packages and letters, the motive-power being electricity. It is urged that this system would greatly facilitate the mail service, and that by its use mails could be forwarded every five minutes between such

points as New York and Boston, the journey in this case being something less than two hours. Even the small shuttle-like carriage used to illustrate the system in Boston, some 4 feet long and weighing 56½ pounds, could carry 1000 letters, which, dispatched every five minutes, would accomplish the present daily work between the New York and Boston post-offices. The power proposed is an Edison incandescent circuit of 110 volts. There is ½ horse-power propelling the carriage at the start, and in such a distance as that from New York to Boston it is estimated that sufficient power could be furnished by five or six stations placed at equal intermediate distances. There appears to be no limit to the speed attained by this system, and the field for the invention is apparently unbounded.

The Pullman Palace-Car Company have again sued the Wagner Palace-Car Company, W. S. Webb, the president, and the Lake Shore and Michigan Southern Railway Company, this time to restrain the railroad company from using the vestibule itself as a completed structure. George M. Pullman has secured letters patent on the structure, the application having been for two years before the patent examiners. The vestibule was in actual use in May, 1887. A suit involving the face-plates was recently decided in favor of the Pullman Company, and if successful in this suit the company will have a complete monopoly of vestibule connections for railway cars.

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CURRENT HARDWARE PRICES.

JUNE 5, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmed Edge, 1-10's.....	25¢
E. B. Grnd. Edge, Cent. Fire.....	25¢
Double Waterproof, 1-10's.....	1.40
Musket Waterproof, 1-10's.....	50¢
G. D.....	28¢
S. B.....	30¢
Union Metallic Cartridge Co.	
F. C. Trimmed.....	50¢
F. L. Ground.....	25¢
Cent. Fire Ground.....	70¢
Dbl. Waterproof.....	1.40
Dbl. Waterproof, in 1-10's.....	1.40
S. B. Genuine Imp.orted.....	45¢
Eley's E. B.....	54¢
Eley's D Waterproof, Central Fire.....	1.60

Cartridges.

Rim Fire Cartridges.....	60¢
Rim Fire Military.....	15¢
Cent. Fire, Pistol and Rifle.....	15¢
Cent. Fire, Military and Sporting.....	15¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal., 1.75.....	2¢
Blank Cartridges, 32 cal., 1.50.....	2¢
Primed Shells and Bullets.....	15¢
B. B. Caps, Round Ball, 1.75.....	2¢
B. B. Caps, Con. Ball, Swgd., 2.00.....	2¢
Primers.....	
Berdan Primers, 1.00.....	2¢
B. L. Caps (for Sturtevant Shells) 1.00.....	2¢
All other Primers, 1.20.....	2¢

Shells.

First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	30¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢
Selbold's Comb. Shot Shells.....	15¢
Brass Shot Shells, 1st quality.....	60¢
Brass Shot Shells, Club, Rival, Climax.....	65¢
I X L, 10 and 12 gauge.....	40¢
"Special," 16 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Fowler's Pat.....	35¢

Shells Loaded—

A. M. Co. List No. 19, 1887.....	20¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up.....	2.00
U. M. C. & W. R. A.—B. E., 9&10.....	2.30
U. M. C. & W. R. A.—B. E., 7&8.....	2.60
U. M. C. & W. R. A.—P. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 9&10.....	3.40
U. M. C. & W. R. A.—P. E., 7&8.....	4.00
Eley's B. E., 11 up.....	1.75
Eley's B. E., 11&20.....	2.80

Anvils.

Eagle Anvils, 10¢.....	20¢
Peter Wright's.....	10¢
Armstrong's Mouse Hole.....	84¢
Armstrong's Mouse Hole, Extra.....	11¢
Trenton.....	12¢
Wilkinson's.....	10¢
J. & Riley Carr, Pat. Solid.....	11¢
Moore & Barnes Mfg. Co.....	33¢

Anvil Vise and Drill—

Millers Falls Co., 18.00.....	20¢
Cheney Anvil and Vise.....	25¢
Allen Anvil and Vise, 3.00.....	40¢

Apple Parers—

Advance.....	5¢
Antrim Combination.....	5.50
Baldwin.....	5.25
Champion.....	7.25
Eureka, 1888.....	each 17.00
Family Bay State.....	5.00
Gem.....	5.25
Gold Medal.....	4.00
Hudson's New '88.....	3.75
Ideal.....	4.75
Improved Bay State.....	30.00
Little Star.....	4.25
Monarch.....	13.50
New Lightning.....	5.50
Oriole.....	4.00
Penn.....	4.00
Perfection.....	4.00
Pomona.....	4.00

Augers and Bits—

Douglas Mfg. Co.....	
Wm. A. Ives & Co.....	
Humphreysville Mfg. Co.....	70¢
French, Swift & Co. (F. H. Beecher, Rockford Bit Company).....	55¢
Cook's, Douglas Mfg. Co.....	50¢
Cook's, N. H. Copper Co. 50¢10¢50¢10¢50¢	
Ives' Circular Lip.....	60¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension lip.....	40¢
C. E. Jennings & Co., No. 30.....	60¢
C. E. Jennings & Co., Auger Bits.....	60¢
32¢ quarters, No. 5, 30; No. 30, 35.50, 20¢	
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	60¢
Pugh's Black.....	60¢
Rockford, Jennings' Pattern.....	60¢
Car Bits.....	50¢10¢60¢
L. Hommedieu Car Bits.....	15¢10¢
Fortner Pat. Auger Bits.....	10¢
Rocking Table.....	50¢
Turntable.....	13.50
Victor.....	4.50
Waverly.....	4.50
White Mountain.....	4.50
70.....	4.25
70.....	4.25
70.....	4.25
70.....	4.25

Hollow Augers—

Ives'.....	25¢10¢
French, Swift & Co.....	25¢10¢5¢
Bonney's Adjustable.....	40¢10¢
Stearns'.....	20¢10¢
Ives' Expansive, each \$4.50.....	50¢5¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢25¢10¢

Expansive Bits—

Clarks' small, 18; large, 26.....	35¢35¢5¢
Ives' No. 4, 20 doz \$60.....	40¢
Swan's.....	40¢
Stearns' No. 1, 26; No. 2, 32.....	35¢
Stearns' No. 2, 418.....	20¢

Gimlet Bits—

Common.....	25¢
Diamond.....	25¢10¢
Bee.....	25¢25¢5¢
Double Cut, Sheppardson's.....	45¢45¢10¢
Double Cut, Cl. Valley Mfg. Co.....	30¢10¢
Double Cut, Hartwell's, 2 doz.....	85¢25
Double Cut, Douglas.....	40¢10¢
Double Cut, Ives.....	60¢60¢10¢

Bit Stock Drills—

Morse Twist Drills.....	50¢10¢5¢
Standard.....	50¢10¢5¢
Cleveland.....	50¢10¢5¢
Syracuse, for metal.....	50¢10¢5¢
Syracuse, for wood (wood list).....	30¢30¢5¢
Williams' or Holt's, for metal.....	50¢10¢10¢
Williams' or Holt's, for wood.....	40¢10¢

Ship Augers and Bits—

L'Hommiedieu's.....	15¢10¢15¢10¢5¢
Watrous'.....	15¢10¢15¢10¢5¢
Snell's.....	15¢10¢15¢10¢5¢
Snell's Ship Auger Pat'n Car Bits.....	15¢10¢15¢10¢5¢

Awl Hafts—

Sewing, Brass Per. 2 gr.....	35¢
Pat. Sewing, Short.....	1.00
Pat. Sewing, Long.....	1.20
Pat. Peg, Plain Top.....	1.00
Pat. Peg, Leather Top.....	1.20

Awls, Brad Sets, &c—

Awls, Sewing, Common.....	1.70
Awls, Should. Peg.....	2.45
Awls, Pat. Peg.....	65¢
Awls, Shouldered Brad.....	2.70
Awls, Handled Brad.....	2.70
Awls, Handled Scratch.....	2.70
Awls, Socket Scratch.....	2.70

Awl and Tool Sets—

Alken's Sets, Awls and Tools.....	55¢10¢
Fray's Adj. Tool Hds., Nos. 1, 2, 3, 4.....	1.12
Miller's Falls Adj. Tool Hds.....	1.12
Miller's Combination Haft.....	25¢
Stanley's Excelsior.....	30¢
Stanley's Excelsior.....	30¢

Axes—

Makers' and Special Brands—	
First quality.....	50¢
Others.....	50¢

Axle Grease—

Fraser's.....	5¢
Fraser's in boxes.....	5¢
Dixon's Everlasting.....	10¢
Dixon's Everlasting.....	10¢
Lower grades, special brands.....	5¢

Axles—

No. 1.....	4¢
Nos. 7 to 14.....	5¢
Nos. 15 to 18.....	47¢
Nos. 19 to 22.....	70¢
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5).....	33¢
Over 10 sets.....	33¢

Bag Holders—

Sprengle's Pat.....	18¢
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Balances—

Spring Balances.....	50¢
Common 24 lb.....	1.50
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

Bells—

Hand—

Light Brass.....	70¢10¢
Extra Heavy.....	60¢10¢
White Metal.....	60¢10¢10¢
Silver Chime.....	35¢
Globe (Cone's Patent).....	25¢10¢35¢

Door—

Gong, Abbe's.....	35¢10¢
Gong, Yankee.....	45¢10¢
Gong, Barton's.....	40¢10¢50¢
Crank, Taylor's.....	25¢10¢
Crank, Brooks'.....	60¢10¢25¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢10¢
Lever, Sargent's.....	60¢10¢
Lever, Taylor's Bronzed or Plated.....	25¢10¢
Lever, Taylor's Japanned.....	25¢10¢
Lever, R. E. M. Co.'s.....	50¢10¢25¢
Pull, Brook's.....	50¢10¢25¢
Pull, Western.....	25¢10¢

Cone—

Common Wrought.....	60¢10¢
Western, Sargent's list.....	20¢10¢
Kentucky, "Star".....	20¢10¢
Kentucky, Sargent's list.....	70¢10¢
Dodge, Genuine Kentucky.....	70¢10¢
Texas Star.....	50¢10¢50¢10¢5¢
Call.....	40¢60¢10¢5¢
Farm Bell.....	25¢30¢34¢
Steel Alloy Church and School Bells.....	40¢

Bellows—

Blacksmiths'.....	50¢10¢5¢60¢
Molders.....	40¢40¢10¢
Hand Bellows.....	40¢10¢50¢

Belt, Rubber—

Common Standard.....	70¢10¢
Standard.....	70¢70¢5¢
Extra.....	60¢5¢60¢10¢
N. Y. B. & P. Co., Carbon.....	60¢10¢5¢
N. Y. B. & P. Co., Diamond.....	50¢10¢

Bench Stops—

Morrill's.....	20¢
Hotchkiss's.....	20¢
Weston's, No. 1, 10; No. 2, 20.....	20¢
McGill's.....	20¢

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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Bit Holders—

Extension.....	40¢
Barber's.....	40¢
Ives.....	40¢
Diagonal.....	40¢
Angular.....	40¢

Blind Adjusters—

Domestic.....	20¢
Excelsior.....	20¢
Washington Self-Locking.....	20¢

Blind Fasteners—

Mackrell's.....	20¢
Van Sand's Screw Pat.....	15¢
Van Sand's Old Pat.....	15¢
Washburn's Old Pattern.....	15¢
Merriman's.....	15¢
Austin & Eddy No. 2008.....	15¢
Security Gravity.....	15¢

Blind Staples—

Barbed, 1/2 in. and larger.....	7¢
Barbed, 3/4 in.....	8¢

Blocks—

Ordinary Tackle, list May 20, 1889.....	40¢10¢50¢
Cleveland Block Co., Mal. Iron.....	50¢
Moore's Novelty, Mal. Iron.....	50¢

Bolts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolts.....	70¢
Cast Iron Chain (Sargent's list).....	65¢10¢
Ives' Patent Door Bolts.....	90¢
Wrought Barrel.....	70¢
Wrought Square.....	70¢
Wrt Shutter, all Iron, Stanley's.....	60¢10¢
Wrt Shutter, Brass Knob.....	40¢10¢
Wrt Shutter, Sargent's list.....	60¢10¢
Wrt Shutter, Stanley's list.....	55¢10¢
Wrt B.K. Flush, Com'n.....	55¢10¢

Carriage, Machine, &c.—

Com. list June 10, '84.....	75¢10¢25¢
Genuine Eagle, list Oct. '84.....	75¢10¢
Phila. pattern, list Oct. '84.....	75¢10¢
R.B. & W., old list.....	70¢
Machine, according to size.....	75¢10¢80¢
Bolt Ends, according to size.....	75¢10¢80¢

Tire—

Common, list Feb. 28, '83.....	70¢
Port Chester Bolt and Nut Company.....	70¢
Empire, list Feb. 28, '83.....	70¢
Phila., list Oct. '84.....	80¢
Keystone, Philadel., list Oct. '84.....	80¢
Norway, Phila., list Oct. '84.....	75¢10¢
American Screw Company.....	75¢10¢
Norway, Phila., list Oct. 16, '84.....	75¢10¢
Eagle, Phila., list Oct. 16, '84.....	80¢
Philadel., list Oct. 16, '84.....	82¢
Ray State, list Feb. 28, '83.....	70¢
R.B. & W., Philadel., list Oct. 16, '84.....	82¢

Slope and Plow—

Stove.....	65¢
R. B. & W., Plow.....	55¢

Borax—

Without.....	9¢
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Boring Machines—

Without.....	7.50
Angers.....	50¢
Douglas.....	50¢
Snell's, Rice's Pat. 5.50.....	6.75
Jennings.....	5.50
Other Machines.....	2.35
Phillips' Patent.....	7.50

Bow Pins—

Humason, Beckley & Co.'s.....	80¢10¢
Sargent & Co.'s.....	80¢10¢
Peck, Stow & W. Co.....	50¢10¢50¢10¢5¢

Braces—

Barber's,	
Nos. 10 to 18.....	50¢
Nos. 30 to 53.....	50¢
Nos. 40 to 63.....	50¢10¢
Barker's,	
Nos. 8, 10 and 12.....	75¢10¢80¢
Plated, Nos. 8, 10 and 12.....	65¢10¢70¢
Osgood's Ratchet.....	40¢10¢50¢
Spofford's.....	50¢5¢50¢10¢
Ives' New Haven Novelty.....	70¢70¢5¢
New Haven Ratchet.....	60¢5¢60¢10¢
Barber Ratchet.....	60¢5¢60¢10¢
Barbers.....	60¢5¢
Spofford.....	60¢5¢60¢10¢
Common Ball, American.....	1.10
Bartholomew's,	
Nos. 25, 27 and 30.....	50¢10¢60¢5¢
Nos. 117, 118, 119.....	70¢70¢5¢
Amidon's.....	75¢10¢80¢
Barker's Imp'd Plain.....	75¢10¢80¢
Barker's Imp. Nickle'd.....	65¢10¢70¢
Ratchet.....	75¢10¢80¢
Eclipse Ratchet.....	60¢
Globe Jaw'd.....	40¢40¢10¢
Globe Ratchet.....	40¢40¢10¢
Universal.....	22.25
Buffalo Ball.....	1.10
P. S. & W.....	50¢10¢

Cards—

Horse & Curry.....10¢10¢10¢10¢10¢
 Cotton.....10¢10¢10¢10¢10¢
 Wool.....10¢10¢10¢10¢10¢

Carpet Stretchers—

Cast Steel, Polished.....doz \$2.25
 Cast Iron, Steel Points.....doz \$0.80
 Socket.....doz \$1.75
 Bullard's.....25¢25¢10¢

Carpet Sweepers—

Bissell No. 5.....doz \$17.00
 Bissell No. 7 New Drop Pan.....doz \$19.00
 Bissell, Grand.....doz \$36.00
 Grand Rapids.....doz \$24.00
 Crown Jewel, No. 1.....\$18.00; No. 2, \$19.00; No. 3, \$20.00
 Magic.....doz \$15.00
 Jewel.....doz \$17.00
 Improved Parlor Queen.....doz \$27.00
 Nickle.....doz \$24.00
 Excelior.....doz \$22.00
 Garland.....doz \$18.00
 Ariel Queen.....doz \$24.00
 Housewife's Delight.....doz \$15.00
 Queen, with band.....doz \$16.00
 King.....doz \$18.00
 Weed, Improved.....doz \$18.00
 Hub.....doz \$16.00
 Cog-Wheel.....doz \$16.00
 Conqueror.....doz \$22.00
 Easy.....doz \$22.00
 Monarch.....doz \$22.00
 Goshen.....doz \$21.00
 Advance.....doz \$18.00
 Ladies' Friend, No. 1.....doz \$15.00; No. 2, \$16.00
 American.....doz \$15.00
 Grand Republic.....doz \$35.00

Cartridges—

See Ammunition.

Casters—

Bed.....Brass.....55¢55¢55¢
 Plate.....Others.....60¢60¢60¢
 Shallow Socket.....40¢10¢
 Deep Socket.....40¢10¢
 Yale Casters, list May, 1884.....30¢10¢40¢
 Yale, Gem.....45¢10¢50¢
 Martin's Patent (Phoenix).....45¢10¢50¢
 Payson's Anti-Friction.....60¢60¢10¢
 Giant Truck Casters.....30¢
 Stationary Truck Casters.....50¢10¢
 Socket Truck Casters.....50¢

Cattle Lenders—

Humason, Beckley & Co.'s.....70¢
 Sargent's.....60¢10¢
 Hotchkiss.....30¢
 Peck, Stow & W. Co.....50¢10¢

Chain—

Trace, 6-10-2, exact.....50¢10¢50¢10¢5¢
 pair, \$1.03.....50¢10¢50¢10¢5¢
 race, 6-10-3, exact.....50¢10¢50¢10¢5¢
 pair \$2.25.....50¢10¢50¢10¢5¢
 Trace, 7-10-2, exact.....50¢10¢50¢10¢5¢
 pair \$1.11.....50¢10¢50¢10¢5¢
 NOTE.—Traces, "Regular" sizes, 3¢ net
 pair less than exact.
 Log, Fifth, Stretcher, and other fancy
 Chains, list Nov. 1, 1884.....50¢10¢50¢10¢5¢
 American Coil, in cask lots.....3-16 ¼ 5-16 ¾ 7-16 ¼ 5 ¾ ¾
 \$5.75 6.25 5.00 4.50 4.40 4.00 3.75 3.50
 Less than cask lots, add ¼¢ per lb.
 German Coil, list of June 20, 1887.....50¢10¢50¢10¢5¢
 German Halter Chain, list of June 20, 1887.....50¢10¢50¢10¢5¢
 Covert Halter, Hitching and Breast.....50¢2¢
 Covert Traces.....35¢2¢
 Oneida Halter Chain.....60¢60¢5¢
 Galvanized Pump Chain.....75¢75¢5¢
 Jack Chain, Iron.....75¢75¢5¢
 Jack Chain, Brass.....70¢70¢5¢

Chalk—

White.....doz 50¢
 Red.....doz 70¢
 Blue.....doz 85¢
 See also Crayons.

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer.
 P. S. & W.....75¢5¢75¢10¢
 New Haven.....75¢5¢75¢10¢
 Witherby.....75¢5¢75¢10¢
 Mix.....75¢5¢75¢10¢
 Ohio Tool Co.....75¢5¢75¢10¢
 Douglass.....75¢5¢75¢10¢
 Buck Bros.....30¢
 Merrill.....60¢10¢40¢10¢5¢
 L. & J. White.....30¢30¢5¢
Tanged and Miscellaneous.
 Tanged Firmer.....40¢10¢50¢
 Butcher's.....\$4.75¢50¢
 Spear & Jackson's.....\$5 to \$2
 Buck Bros.....30¢
 Cold Chisels.....16¢19¢

Chucks—

Beach Pat.....each \$8.00.....20¢
 Morse's Adjustable, each, \$7.00, 20¢20¢5¢
 Danbury.....each, \$6.00, 30¢30¢5¢
 Syracuse, Balz Pat.....25¢
 Skinner's Pat. Drill Chucks.....30¢
 Skinner's Independent Lathe Chucks.....40¢
 Skinner's Pat. Comb. Chuck.....40¢

Clamps—

R. I. Tool Co.'s Wrought Iron.....25¢
 Adjustable, Gray's.....20¢
 Adjustable, Lambert's.....20¢
 Adjustable, Snow's.....40¢5¢
 Adjustable, Hammers.....15¢
 Adjustable, Stearn's.....20¢10¢
 Stearn's Adjustable Cabinet and Cor-
 ner.....20¢10¢
 Cabinet, Sargent's.....60¢10¢
 Carriage Makers', Sargent's.....70¢10¢
 Eberhard Mfg. Co.....40¢5¢40¢10¢
 Warner's.....40¢10¢40¢10¢5¢
 Saw Clamps, see Vises

Clips—

Norway, Axle, ¼ & 5-16.....55¢5¢5¢
 2nd grade Norway Axle, ¼ & 5-16.....65¢5¢
 Superior Axle Clips.....60¢5¢60¢5¢
 Norway Spring Bar Clips, 5-16.....60¢5¢
 Wrought Iron Felloe Clips.....½¢, 5¢
 Steel Felloe Clips.....½¢, 5¢
 Baker Axle Clips.....25¢

Cockeyes—

50¢

Cocks, Brass.

Hardware list.....40¢10¢2¢

Coffee Mills—

Box and Side, list Jan. 1, 1888.....50¢2¢
 American, Enterprise Mfg. Co. 20¢10¢30¢
 The Swift, Lane Bros.....20¢10¢

Compasses Dividers, &c—

Compasses, Callipers, Dividers, 70¢70¢10¢
 Bemis & Call Co.'s.....60¢5¢
 Dividers.....50¢5¢
 Compasses & Callipers.....50¢5¢
 Wing and Inside or Outside.....50¢5¢
 Double.....60¢
 (Call's Pat. Inside).....30¢
 Excelsior.....60¢
 J. Stevens & Co.'s.....25¢10¢
 Starrett's.....25¢10¢
 Spring Callipers and Dividers 25¢10¢10¢
 Lock Callipers and Dividers.....25¢10¢
 Combination Dividers.....25¢10¢

Coopers' Tools—

Bradley's.....20¢
 Barton's.....20¢20¢5¢
 L. & J. White.....25¢
 Albertson Mfg. Co.....25¢
 Beatty's.....30¢
 Sandusky Tool Co.....30¢30¢5¢

Corkscrews—

Humason & Beckley Mfg. Co. 40¢40¢10¢
 Clough's Pat.....33¢40¢35¢5¢
 Howe Bros & Hulbert.....35¢

Core Knives and Cutters—

Bradley's.....10¢
 Wadsworth's.....25¢

Cradles—

Grain.....50¢2¢

Cravens.

White Crayons, ½ gr 12¢12¢10¢
 D. M. Stewart Mfg. Co., Metal Work-
 ers, ½ gr, \$2.50.....25¢
 D. M. Stewart Mfg. Co., Rolling Mill.....25¢
 See also Chalk.

Crow Bars—

Cast Steel.....½¢4¢
 Iron, Steel Points.....½¢3¢5¢

Curry Combs—

Fitch's.....50¢10¢50¢10¢10¢
 Rubberper doz \$10.00.....20¢
 Perfect.....50¢

Curtain Pins—

Silvered Glass.....net
 White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....33¢
 Wostenholme.....\$7.75 to \$2

Dampers, &c—

Dampers, Buffalo.....40¢10¢
 Buffalo Damper Clips.....40¢10¢
 Crown Damper.....40¢
 Excelsior.....40¢10¢

Dividers—

See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list.....30¢10¢
 Leather, Pope & Steven's list.....40¢
 Brass, Pope & Steven's list.....40¢

Door Springs—

Torrey's Rod, regular size.....doz \$1.30
 Gray's, ½ gr, \$20.00.....20¢
 Bee Rod ½ gr, \$20.00.....20¢
 Warner's No. 1, ½ doz, \$2.50; No. 2, \$3.30.....40¢10¢
 Gem (Coil), list April 19, 1886.....10¢
 Star (Coil), list April 19, 1886.....20¢
 Victor (Coil).....60¢60¢10¢
 Champion (Coil).....60¢10¢60¢10¢
 Philadelphia, 5 in., \$5.00; 8 in., \$7.75.....20¢
 Cowell's.....No. 1, ½ doz, \$18.00; No. 2, \$15.00.....50¢
 Rubber, complete, ½ doz, \$4.50.....55¢10¢
 Hercules.....50¢
 Shaw Door Check and Spring, 25¢30¢35¢

Drawing Knives—

Witherby.....75¢5¢
 Mix.....75¢10¢
 New Haven.....75¢10¢
 Merrill.....60¢10¢60¢10¢5¢
 Douglas.....75¢75¢5¢
 Watrous.....15¢10¢25¢
 L. & J. White.....20¢5¢
 Bradley's.....35¢
 Adjustable Handle.....25¢33¢4¢
 Wilkinson's Folding.....25¢25¢5¢

Drills and Drill Stocks—

Blacksmith's.....each \$1.75
 Blacksmith's Self-Feeding, each \$7.50, 20¢
 Breast, P. S. & W.....40¢10¢
 Breast, Wilson's.....30¢5¢
 Breast, Millers Falls.....each \$3.00, 25¢
 Breast, Bartholomew's.....each \$2.50, 25¢
 Ratchet, Merrill's.....25¢10¢40¢
 Ratchet, Ingersoll's.....20¢20¢5¢
 Ratchet, Parker's.....20¢20¢5¢
 Ratchet, Whitney's.....20¢10¢
 Ratchet, Weston's.....20¢25¢
 Ratchet, Moore's Triple Action.....25¢30¢
 Whitney's Hand Drill, Plain, \$11.00.....10¢
 Adjustable, \$12.00.....30¢10¢
 Wilson's Drill Stocks.....10¢10¢
 Automatic Boring Tools.....\$1.75¢1.85

Twist Drills—

Morse.....50¢10¢5¢
 Standard.....50¢10¢5¢
 Syracuse.....50¢10¢
 Cleveland.....50¢10¢5¢
 Williams.....50¢10¢10¢
 New Process.....50¢10¢5¢

Drill Bits.—See Augers and Bits.**Drill Chucks.—See Chucks.****Dripping Pans—**

Small sizes.....½¢ 6¢½¢
 Large sizes.....½¢ 6¢½¢

Egg Beaters.

Dover.....doz \$1.50
 National, ½ doz \$4.50.....35¢5¢
 Family (T. & S. Mfg. Co.), ½ doz \$17.00.....\$18.00
 Duplex (Standard Co.).....doz \$15.00
 Rival (Standard Co.).....doz \$12.00
 Large Duplex (Standard Co.), ½ doz \$4.50
 Triumph (T. & S. Mfg. Co.), ½ doz \$10.50

Advance, No. 1.....doz \$11.50
 Advance, No. 2.....doz \$10.00
 Bryant's.....doz \$15.00
 Ayres' Spiral.....doz \$5.00
 Double (H. & R. Mfg. Co.).....doz \$16.20
 Triple (H. & R. Mfg. Co.).....doz \$14.00
 Spiral (H. & R. Mfg. Co.).....doz \$4.50
 Paine, Diehl & Co.'s.....doz \$24.00

Egg Poachers—

Buffalo Steam Egg Poachers, ½ doz, No. 1, \$6.00; No. 2, \$9.00.....25¢

Electric Bell Sets.—

Wollensak's.....20¢
 Bigelow & Dowse.....20¢

Emery—

No. 4 to No. 54 to Flour, CF 46 gr. 150 gr. F FF.
 Kegs, ½ doz.....4¢½¢
 ¼ doz.....5¢½¢
 1/8 doz.....5¢½¢
 1/16 doz.....5¢½¢
 10-cans, 6 e.....6¢½¢
 10-cans, less than 10.....10 e 10 e 7½¢

Enamelled and Tinned Ware—

See Hollow-Ware.

Escacheon Pins—

Iron, list Nov. 11, 1885.....50¢10¢50¢10¢5¢
 Brass.....60¢60¢5¢

Escutcheons.

Door Lock.....Same dis as Door Locks.
 Lockport Metal Plug, reduced list.....60¢
 Wood.....25¢

Faucets.—

Fenn's.....40¢
 Bohren's Pat. Rubber Ball.....25¢
 Fenn's Cork Stops.....33¢4¢
 Star.....60¢
 Stray's Pat. Petroleum.....40¢5¢2¢
 B. & L. B. Co.....50¢
 West's Lock, Open and Shut Key.....50¢
 Star Metal Plug, new list.....40¢
 Lockport Metal Plug, reduced list.....60¢
 Metallic Key, Leather Lined.....60¢10¢10¢

Faucets.—

Cork Lined.....70¢5¢70¢10¢
 Burnside's Red Cedar.....50¢
 Burnside's Red Cedar, bbl lots.....50¢10¢
 John Sommers'.....40¢
 Peerless Best Block Tin Key.....40¢
 L. L. quality, Cork Lined.....40¢
 Diamond Lock.....40¢
 Perfection, Fla. Red Cedar.....50¢
 Goodenough Cedar.....50¢
 Boss Metallic Key.....50¢
 Reliable Cork Lined.....60¢
 Western Pattern Cork Lined.....50¢

Self-Measuring

Enterprise, ½ doz \$50.00.....20¢10¢
 Lane's, ½ doz \$36.00.....25¢10¢
 Victor, ½ doz \$36.00.....25¢10¢

Felloe Plates.

Victor.....½¢ 6¢6¢½¢

Fifth Wheels.—

Derby and Cincinnati.....47¢5¢

Files—

Domestic—
 Nicholson Files, Rasps, &c.....60¢10¢60¢
 Nicholson (X. F.) Files.....10¢5¢
 Nicholson's Royal Files (Seconds).....75¢
 (extra prices on certain sizes)
 Other makers, best brands.....60¢10¢60¢10¢10¢
 Fair brands.....60¢10¢60¢10¢70¢
 Second quality.....70¢10¢75¢10¢
 Nicholson's Horse Rasps.....60¢10¢60¢
 10¢5¢
 Heller's Horse Rasps.....50¢7¢45¢10¢
 L. & R. Carr Horse Rasps.....10¢
 Moss & Gamble.....list, April 1, 1883, 15¢
 Batchelor.....Butcher's list, 20¢
 Stubbs.....Stubbs list, 25¢30¢
 Turton's.....Turton's list, 20¢25¢
 Greaves' Horse Rasps, American list, 60¢

Imported—

J. & Riley Carr.....list, April 1, 1883, 15¢
 L. & R. Carr Horse Rasps.....10¢
 Moss & Gamble.....list, April 1, 1883, 15¢
 Batchelor.....Butcher's list, 20¢
 Stubbs.....Stubbs list, 25¢30¢
 Turton's.....Turton's list, 20¢25¢
 Greaves' Horse Rasps, American list, 60¢

Fluting Machines—

Knox, 4½-inch Rolls.....\$3.25 each } 35¢
 Knox, 6-inch Rolls.....\$3.60 each } 35¢
 Eagle, 3½-inch Roll, \$2.15.....35¢
 Eagle, 5½-inch Roll, \$2.85.....35¢
 Crown, 4½ in., \$3.50; 6 in., \$4.00; 8 in., \$6.50 each.....35¢
 Crown Jewel, 6 in.....\$3.50 each, 35¢
 American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35¢
 Domestic Fluter.....each, \$1.50
 Geneva Hand Fluter, White Metal.....doz \$12, 25¢
 Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00.....30¢
 Shepard Hand Fluter, No. 85.....doz \$15.00
 Shepard Hand Fluter, No. 110.....doz \$11.00
 Shepard Hand Fluter, No. 95.....doz \$8.00
 Clark's Hand Fluter, ½ doz \$15.00.....35¢
 Combined Fluter and Sad Iron.....doz \$15.00.....30¢
 Buffalo.....doz \$10.00.....10¢

Fluting Scissors—

Blair's.....doz \$2.00

Fodder Squeezers—

Blair's "Climax".....doz \$1.25

Forks—

Hay, Manure, &c., Asso. List.....65¢
 Hay, Manure, &c., Phila. List 60¢60¢5¢
 Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....60¢10¢5¢
 Shepard's Lightning.....65¢40¢5¢
 White Mountain.....50¢20¢5¢
 New Arctic.....50¢40¢5¢
 American.....60¢
 Gem.....65¢
 Blizard.....70¢
 Double Action Crown.....60¢
 Crown.....60¢
 Star.....60¢
 Peerless and Giant.....60¢10¢
 Zero and Pet.....65¢10¢
 Boss.....65¢10¢10¢

Fruit and Jelly Presses—

Enterprise Mfg. Co.....20¢10¢30¢
 Hens.....doz \$2.50
 Shepard's Queen City.....40¢

Fry Pans—

High List.....75¢5¢75¢10¢
 No.....0 1 2 3 4
 doz.....\$3.75 \$4.70 \$5.30 \$5.95 \$6.55
 No.....5 6 7 8
 doz.....\$7.50 \$8.75 \$10.00 \$11.25
 Low List.....65¢10¢
 No.....0 1 2 3 4
 doz.....\$3.00 \$3.75 \$4.25 \$4.75 \$5.25
 No.....5 6 7 8
 doz.....\$6.00 \$7.00 \$8.00 \$9.00

Fuse—

Common Hemp Fuse, for dry ground, \$2.70
 Common Cotton Fuse, for dry ground, 2.35
 Single Taped Fuse, for wet ground, 4.25
 Double Taped Fuse, for very wet gr., 5.40
 Triple Taped Fuse, for very wet gr., 6.50
 Small Gutta Percha Fuse, for water, 7.50
 Large Gutta Percha Fuse, for water, 12.00

Gauges—

Marking, Mortise, &c.....60¢10¢
 Starrett's Surface, Center and Scratch.....25¢10¢

Wire, low list.....10¢10¢
 Wire, Wheeler, Madden & Co.....10¢
 Wire, Morse's.....50¢50¢5¢
 Wire, Brown & Sharpe's.....10¢20¢

Gimlets—

Nail and Spike.....50¢10¢5¢
 "Eureka" Gimlets.....40¢10¢
 "Diamond" Gimlets.....½ gr \$5.00
 Double Cut, Shepardson's.....45¢45¢5¢
 Double Cut, Ives.....60¢60¢5¢
 Double Cut, Douglas.....40¢10¢
 "Bee," ½ gr \$12.....25¢25¢5¢

Glue—

Le Page's Liquid.....25¢25¢5¢
 Upton's Liquid.....35¢
 Le Page & Co.'s Improved Process.....25¢25¢5¢

Glue Pots—

Tinned.....40¢
 Enamelled.....40¢5¢
 Family, Howe's "Eureka".....40¢
 Family, L. F. C.'s "Handy".....50¢

Grindstones—

Small, at factory.....½ ton \$7.50¢9.00

Grindstone Fixtures—

Sargent's Patent.....70¢10¢
 Reading Hardware Co.....30¢10¢

Hack Saws.—

See Saws.

Halters—

Covert's, Rope, ½-in. Jute.....50¢2¢
 Covert's, Rope, ½-in. Hemp.....40¢2¢
 Covert's Adj. Rope Halter.....40¢2¢
 Covert's Hemp Horse and Cattle Tie.....60¢2¢
 Covert's Jute Horse and Cattle Ties.....60¢10¢2¢

Hammers—

Handled Hammers—
 Maydole's, list Dec. 1, '85.....25¢10¢35¢
 Buffalo Hammer Co. (list Jan. 15, '87)
 Humason & Beckley.....50¢50¢10¢
 Atha Tool Co.....40¢10¢50¢
 Fayette R. Plumb.....40¢10¢50¢
 C. Hammond & Son.....40¢10¢50¢
 Verree.....5¢
 Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75.....30¢10¢
 Nelson Tool Works.....20¢25¢
 Warner & Nobles.....20¢25¢
 Peck, Stow & Wilcox.....40¢
 Sargent's.....33¢10¢
Heavy Hammers and Sledges—
 3 lb and under.....½ doz 40¢ 60¢10¢
 5 to 8 lb.....½ doz 30¢ 10¢ 7

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, pair, 30¢; No. 3, 22¢; No. 2, and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles, 50¢.
Champion, 15¢.

Hangers
Barn Door, old patterns, 60¢10¢10¢70¢
Barn Door, New England, 60¢10¢10¢70¢
Samson Steel Anti-Friction, 55¢
Orleans Steel, 55¢
Hamilton Wrought Wood Track, 55¢
U. S. Wood Track, 65¢
Champion, 60¢10¢
Rider and Wooster, Medina Wfg. Co.'s, 70¢
List, 70¢
Climax Anti-Friction, 60¢
Limax Anti-Friction for Wood Track, 55¢
Zenith for Wood Track, 55¢
ed's Steel Arm, 50¢
allenge, Barn Door, 50¢
Sterling's Improved (Anti-Friction), 65¢10¢
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00, 50¢
Cheritree, 50¢10¢
Kiddier, 50¢10¢
The Boss, 60¢10¢
Best Anti-Friction, 60¢10¢
Duplex (Wood Track), 60¢10¢5¢
Terry's Pat., 50¢ pr. 4, \$10.00; 5 in., \$12.00, 50¢50¢10¢
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00, 50¢15¢60¢
Wood Track Iron Clad, 50¢
Carrier Steel Anti-Friction, 50¢50¢5¢
Architect, 50¢ set \$6.00, 30¢
Eclipse, 50¢10¢
Felix, 50¢ set \$4.00, 20¢
Richards', 30¢30¢10¢
Lane's Steel Anti-Friction, 40¢10¢
Ball Bearing Door Hanger, 30¢10¢25¢10¢
Warner's Pat., 30¢20¢10¢
Stearns' Anti-Friction, 20¢20¢10¢
Stearns' Challenge, 25¢10¢25¢10¢10¢
Faultless, 40¢40¢5¢
American, 50¢ set \$6.00, 20¢10¢
Rider & Wooster, No. 1, 62¢; No. 2, 75¢, 40¢
Paragon, Nos. 1, 2 and 3, 40¢10¢
Paragon, Nos. 5, 6, 7 and 8, 20¢10¢
Crescent, 60¢60¢10¢
Nickel, Cast Iron, 50¢
Nickel, Malleable Iron and Steel, 40¢
Scranton Anti-Friction Single Strap, 35¢4¢
Scranton Anti-Friction Double Strap, 40¢
Universal Anti-Friction, 40¢
Wild West, 4 in. Wheel, \$16.00; 5 in. Wheel, \$21.00, 45¢
Star, 40¢10¢40¢10¢5¢
May, 50¢5¢50¢10¢
Barry, \$6.00, 40¢10¢

Harness Snaps—
See Snaps.

Hatchets—
List Jan. 1, 1888.
Isaiah Blood, 35¢40¢
Hunt's Shingling Lath and Claw, 40¢5¢
Hunt's Broad, 40¢
Buffalo Hammer Co., 40¢10¢50¢
Hurd's, 40¢10¢50¢
Fayette R. Plumb, 40¢10¢50¢
Wm. Mann, Jr., & Co., 50¢50¢5¢
Underhill Edge Tool Co., 40¢10¢50¢
Underhill's, 40¢10¢50¢
C. Hammond & Son, 40¢10¢50¢
Simmons', 40¢10¢50¢
Peck's, 40¢10¢40¢10¢5¢
Kelly's, 50¢50¢5¢
Sargent & Co., 50¢
Ten Eyck Edge Tool Co., 40¢10¢40¢5¢
Collins, 10¢
Schulte, Lohoff & Co., 50¢50¢5¢

Hay and Straw Knives—
Lightning, Mfrs. price \$18.00, 25¢
But jobbers frequently give extras.
Gem, 50¢ doz \$10
Wadsworth's, 40¢75¢40¢10¢
Carter's Needle, 50¢ doz \$11.50¢12.00
Heath's, 50¢ doz \$13.50¢14.00
Auburn Hay, Corn, and Spear Point, 50¢
Auburn, Straw, 40¢
Noll's Hay, 50¢ doz \$10.00

Hinges—
Wrought Iron Hinges
Strap and T, 75¢5¢75¢10¢
Screw Hook and Strap, 6 to 12 in., 34¢
14 to 20 in., 34¢
22 to 36 in., 34¢
Heavy Welded Hook, 6 to 12 in., 34¢
14 to 20 in., 34¢
22 to 36 in., 34¢
Screw Hook and Eye, 34 in., 50¢ doz \$1.50
34 in., 50¢ doz \$2.45
34 in., 50¢ doz \$3.80
Rolled Blind Hinges, Nos. 32 and 34, 50¢10¢
Rolled Blind Hinges, Nos. 232 and 234, 55¢10¢
Rolled Plate, 70¢10¢
Rolled Raised, 70¢10¢
Plate Hinges, 8, 10 & 12 in., 50¢
"Providence," over 12 in., 44¢
Spring Hinges—
Geer's Spring and Blank Butts, 40¢
Union Spring Hinge Co.'s list, March, 1888, 20¢
Acme and U. S., 30¢
Empire and Crown, 30¢
Hero and Monarch, 50¢
American, Gem, and Star, Japanized, 20¢
American, Gem, and Star, Bronzed, 20¢
Oxford, Bronze and Brass, 20¢
Barker's Double Acting, 20¢10¢
Union Mfg. Co., 20¢
Bommer's, 30¢
Buckman's, 15¢20¢
Chicago, 30¢
Wiles', 10¢
Devore's, 40¢
Rex, 40¢
Royal, 60¢
Reliable, 60¢
Champion, 60¢

Gate Hinges—
Western, 50¢ doz \$4.40, 60¢
E. E., 50¢
N. E. Reversible, 50¢ doz \$5.20, 50¢10¢
Clark's, Nos. 1, 2, 3, 60¢10¢5¢
N. Y. State, 50¢ doz \$5.00, 55¢10¢
Automatic, 50¢ doz \$12.50, 50¢
Common Same, 50¢ doz pair \$4.50, 50¢
Seymour's, 45¢10¢
Shepard's, 50¢10¢
Reed's Latch and Hinges, 50¢ doz \$12.00, 50¢

Blind Hinges—
Parker, 75¢2¢
Palmer, 50¢50¢10¢
Seymour, 70¢2¢
Nicholson, 45¢10¢
Ruffer, 50¢

Clark's, Nos. 1, 3, 5, 40 and 50, 75¢10¢5¢90¢
Clark's Mortise Gravity, 50¢
Sargent's, Nos. 1, 3, 5, 11, 15, 75¢10¢55¢10¢5¢
Sargent's, No. 12, 77¢10¢10¢
Reading's Gravity, 75¢10¢10¢5¢
Shepard's, 75¢10¢5¢
Noiseless, 80¢2¢5¢
Niagara, 80¢2¢5¢
Buffalo, 80¢2¢5¢
Clark's Genuine Pat., 80¢2¢5¢
O. S. Lull & Porter, 75¢10¢
Acme, Lull & Porter, 75¢10¢
Queen City Reversible, 75¢
Clark's Lull & Porter, Nos. 9, 1, 15, 2, 25¢, 75¢10¢2¢5¢
North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50, 25¢2¢

Hoes—

Handled—
Garden, Mortar, &c., 65¢
Planter's, Cotton, &c., 65¢
Warren Hop, 60¢
Magic, 50¢ doz \$4.00
Eye—
D. & H. Scovill, 20¢
Lane's Crescent Planter's Pattern, 45¢5¢
Lane's Razor Blade, Scovill Pattern, 30¢
Maynard, S. & O. Pat., 45¢5¢
Sandusky Tool Co., S. & O. Pat., 60¢
Hubbard & Co., S. & O. Pat., 60¢
Chattanooga Tool Co., S. & O. Pat., 60¢
Grub, 60¢60¢10¢

Hog Rings and Ringers—
Hill's Improved Ringers, 50¢ doz \$4.25
Hill's Old Style Ringers, 50¢ doz \$2.75
Hill's Tongue, 50¢ doz \$4.50
Hill's Rings, 50¢ doz \$2.15¢2.25
Perfect Rings, 50¢ doz \$1.60¢1.70
Perfect Ringers, 50¢ doz \$2.15¢2.25
Blair's Hog Ringers, 50¢ doz \$2.25¢2.50
Champion Ringers, 50¢ doz \$2.00
Champion Rings, Double, 50¢ doz \$2.25
Brown's Ringers, 50¢ doz \$2.00
Brown's Rings, 50¢ doz \$1.25¢1.30

Hoisting Apparatus—
Moore's Hand Hoist, with Lock, 20¢
Moore's Differential Pulley Block, 40¢
Energy Mfg. Co.'s, 25¢

Holders, File and Tool—
Bals Pat., 50¢ doz \$4.00; 25¢
Nicholson File Holders, 20¢

Hollow-Ware—

Iron—
Stove Hollow-Ware, 60¢60¢5¢
Unground, 60¢10¢60¢10¢10¢
Boilers and Saucepans, 40¢5¢
Tinned Boilers and Saucepans, 40¢5¢
Gray Enamelled-Ware—
Stove, 45¢50¢
Mauhin Kettles, 60¢10¢60¢10¢10¢
Boilers and Saucepans, 40¢5¢
Angus and Granite Ware, list Jan. 1, 1889, 33¢10¢
Rustless Hollow-Ware, 50¢50¢5¢
Galvanized Tea-Kettles—
Inch, 6 7 8 9
Each, 55¢ 60¢ 65¢ 75¢
4 mo. or 5 ¢ cash in 30 days.
Reed & Barton, 40¢5¢
Harden Britannia Co., 40¢5¢
Simpson, Hall, Miller & Co., 40¢5¢
Rogers & Brother, 40¢5¢5¢
Hartford Silver Plate Co., 40¢5¢5¢
William Rogers Mfg. Co., 40¢5¢5¢

Hooks—
Cast Iron—
Bird Cage, Sargent's list, 60¢10¢10¢
Bird Cage, Reading list, 60¢10¢10¢
Clothes Line, Sargent's list, 60¢10¢60¢10¢10¢
Clothes Line, Reading list, 60¢10¢60¢10¢10¢
Celling, Sargent's list, 55¢10¢10¢
Harness, Reading list, 55¢10¢60¢10¢10¢
Coat and Hat, Sargent's list, 55¢10¢60¢10¢10¢
Coat and Hat, Reading, 50¢10¢50¢10¢10¢
Wrought Iron—
Cotton, 50¢ doz \$1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks), 30¢
Tassel and Picture (T. & S. Mfg. Co.), 50¢
Wrought Staples, Hooks, &c., 50¢
See Wrought Goods.

Wire—
Wire Coat and Hat, Gem, list April, 1888, 45¢
Wire Coat and Hat, Miles, list April, 1888, 45¢
Indestructible Coat and Hat, 45¢
Wire Coat and Hat, Standard, 45¢
Belt, 75¢10¢80¢
Miscellaneous.
Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50
Fish Hooks, American, 50¢ doz \$2.25
Bush, 55¢60¢
Whiffletree—Patent, 55¢
Hooks and Eyes—Malleable Iron, 70¢70¢10¢
Hooks and Eyes—Brass, 60¢10¢10¢
Bench Hooks, American, 50¢
Bench Hooks, 50¢
See Bench Hooks.

Horse Nails—
Nos. 6 7 8 9 10
Ausable, 28¢ 20¢ 25¢ 24¢ 23¢
Clinton, Fin. 24¢ 22¢ 21¢ 20¢ 19¢
Essex, 28¢ 20¢ 25¢ 24¢ 23¢
Lyra, 25¢ 23¢ 22¢ 21¢ 20¢
Snowden, 25¢ 23¢ 22¢ 21¢ 20¢
Putnam, 23¢21¢ 20¢ 19¢ 18¢
1000 lb in year 15¢
Vulcan, 23¢ 21¢ 20¢ 19¢ 18¢
Northwest'n, 25¢ 23¢ 22¢ 21¢ 20¢
Globe, 23¢ 21¢ 20¢ 19¢ 18¢
Boston, 23¢ 21¢ 20¢ 19¢ 18¢
A. C., 25¢ 23¢ 22¢ 21¢ 20¢
C. R.-K., 25¢ 23¢ 22¢ 21¢ 20¢
Champlain, 28¢ 26¢ 25¢ 24¢ 23¢

New Haven, 28¢ 26¢ 25¢ 24¢ 23¢
Saracac, 23¢ 21¢ 20¢ 19¢ 18¢
Champion, 25¢ 23¢ 22¢ 21¢ 20¢
Capewell, 28¢ 26¢ 25¢ 24¢ 23¢
Star, 23¢ 21¢ 20¢ 19¢ 18¢
Anchor, 23¢ 21¢ 20¢ 19¢ 18¢
Western, 23¢ 21¢ 20¢ 19¢ 18¢
Empire Bronzed, 11 ¢
Horse Shoes—See Shoes Horse.

Hose, Rubber—

Competition, 75¢10¢75¢10¢5¢
Standard, 70¢70¢10¢
Extra, 60¢60¢10¢
N. Y. B. & P. Co., Para, 30¢10¢
N. Y. B. & P. Co., Extra, 50¢
N. Y. B. & P. Co., Dundee, 60¢10¢5¢

Huskies—

Blair's Adjustable, 50¢ gr \$8.00
Blair's Adjustable Clipper, 50¢ gr 7.00

Indurated Fiber-Ware.

Spittoson, No. 2, 50¢ doz \$6.75
Basins, Ringed, 50¢ doz, No. 1, \$3.70; No. 2, \$3.10; No. 3, \$2.70
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), 50¢ doz, nested, \$16.87
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), 50¢ doz, nested, \$4.37
Butter Bowls, 15, 17 and 19 inch (3 pieces), 50¢ doz, nested, \$6.75
Liquid Measures, pt., qt., 2 qt. and funnel-dry (4 pieces), 50¢ set, \$3.00
Dry Measures, 1, 2, 4, 8 and 16 qts (5 pieces), 50¢ set, \$2.25
See also Fruit.

Jack Screws—See Screws.

Kettles— Spun, Stamped.
Brass, 7 to 17 in., 24¢ 21¢
Brass larger than 17 in., 26¢ 23¢
Enamelled and Tea Kettles, See Hollow-Ware.

Keys—

Lock Ass'n list Dec. 30, 1888, 50¢10¢
Eagle Cabinet, &c., 60¢5¢
Hotchkiss' Brass Blanks, 33¢42¢
Hotchkiss' Brass Blanks, 40¢
Hotchkiss' Pad, and Cab., 35¢
Ratchet Bed Keys, 50¢ doz \$4.00, 15¢
Wollensak Tinned, 50¢10¢

Knife Sharpeners—

Parkin's, Applewood Handles, 50¢ doz \$6.00, 40¢
Rosewood or Cocobolo, 50¢ doz \$6.00, 40¢

Knives—

Wilson's Butcher Knives, 25¢30¢
Ames' Butcher Knives, 25¢
Foster Bros' Butcher, &c., 40¢
Nichols' Butcher Knives, 40¢10¢
Ames' Shoe Knives, 20¢25¢
Ames' Bread Knives, 50¢ doz \$1.50, 15¢20¢
Moran's Shoe and Bread, 20¢
Hay and Straw, See Hay Knives.
Table and Pocket, See Cutlery.
Corn, Auburn Mfg. Co. Crescent, \$2.50

Knobs—

Door Mineral, 65¢68¢
Door Por. Jap'd, 75¢78¢
Door Por. Nickel, 82¢00¢2.25
Door Por. Plate, Nickel, 82¢00¢2.25
Drawer, Porcelain, 60¢10¢60¢10¢10¢
Hemacite Door Knobs, 40¢10¢50¢
Yale & Towne Wood, list Dec., 1888, 40¢
Furniture Plain, 75¢ gro inch, 10¢
Furniture Wood Screws, 25¢10¢
Base, Rubber Tip, 70¢10¢5¢
Picture, Judd's, 60¢10¢10¢70¢
Picture, Sargent's, 70¢10¢
Picture, Hemacite, 35¢5¢
Shutter, Porcelain, 65¢10¢
Carriage, Jap., 50¢ gro 80¢, 60¢10¢

Lades—

Melting, Sargent's, 55¢10¢
Melting, Reading, 35¢10¢
Melting, Monroe's Pat., 50¢ doz \$4.00, 40¢
Melting, P. S. & W., 35¢10¢40¢
Melting, Warner's, 30¢

Lawn Mowers—

Standard List, 50¢10¢
Quaker City, 60¢10¢
Enterprise, 60¢10¢

Lanterns—

Tubular—
Plain with Guards, 50¢ doz \$4.00¢4.25
Lift Wire, with Guards, \$4.50¢4.75
Square Plain, with Guards, \$4.00¢4.25
Sq. Lift Wire, with Guards, \$4.25¢4.50
Without Guards, 25¢ doz less.
Miscellaneous.
Police, Small, \$6.00; Medium, \$7.25;
Large, \$9.75, 20¢25¢

Lemon Squeezers—

Porcelain Lined, No. 1, 50¢ doz \$6.00, 25¢30¢
Wood, No. 2, 50¢ doz \$3.00, 35¢
Wood, Common, 50¢ doz \$1.70¢1.75
Dunlap's Improved, 50¢ doz \$3.75, 30¢
Sammls., No. 1, \$5.00; No. 2, \$9; 12, \$18
Jennings' Star, 50¢ doz \$2.50
The Boss, 50¢ doz \$2.50
Dean's, Nos. 1, 50¢ doz \$6.50; 2, \$3.35; 3, \$1.90
Little Giant, 50¢50¢5¢
King, 40¢5¢

Lines—

Cotton and Linen Fish, Draper's, 50¢
Draper's Chalk, 90¢
Draper's Mason's Linen, \$4 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25, 25¢
Cotton Chalk, 55¢
Samson, Cotton, No. 4, \$2; No. 4½, \$2.50, 15¢
Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50, 25¢
Mason's Linen, No. 3½, \$1.50; No. 4, \$2.00; No. 4½, \$2.50, 25¢
Mason's Colored Cotton, 45¢
Wire Clothes, Nos. 18 20 22, \$3.00 \$3.00 \$2.50

Ventilator Cord, Samson Braided, White or Drab Cotton, 50¢ doz \$7.50, 20¢

Locks, &c.—

Door Locks, Latches, &c.
List Dec. 30, '86, chgd Feb. 2, '87, 50¢10¢60¢10¢
R. & E. Mfg. Co., list Mar. 20, 1889, 60¢10¢
Mallory, Wheeler & Co., list July, '88, 50¢10¢60¢10¢
Sargent & Co., list Aug. 1, '88, 55¢2¢
Reading Hardware Co., list Feb. 2, '88, 55¢60¢10¢
Note—Lower net prices often made.

Perkins' Burglar Proof, 90¢25¢
Plate, 33¢42¢
F. Many's "Extension Cylinder" \$10.50
Barnes Mfg. Co., 40¢40¢10¢
Deltz Flat Key, 30¢
L. & C. Round Key Latches, 30¢10¢
L. & C. Flat Key Latches, 30¢10¢
Romer's Night Latches, 15¢
Shepardson or U. S., 35¢
Felter or American, 40¢10¢
Seed's N. Y. Hasp Lock, 25¢

Cabinets—

Eagle, Gaylord Par., list March, '84, rev. ker and Corbin, Jan. 1, '85, 33¢42¢
Deltz, Nos. 36 to 39, 40¢
Deltz, Nos. 51 to 63, 40¢10¢
Deltz, Nos. 86 to 96, 30¢
Stoddard Lock Co., 30¢33¢4¢
"Champion" Night Latches, 40¢
Barnes Mfg. Co., 40¢40¢10¢
Eagle and Corbin Trunk, 25¢2¢
"Champion" Cab. and Corbin, 33¢4¢
Yale, 30¢ net prices
Romer's, 25¢

Padlocks—

List Dec. 23, '84, 75¢75¢10¢
Yale Lock Mfg. Co.'s, net prices
Eagle, 25¢2¢
Eureka, Eagle Lock Co., 40¢2¢
Romer's, Nos. 0 to 91, 30¢
Romer's Scandinavian, &c., Nos. 100 to 505, 15¢
A. E. Deltz, 40¢
Champion Padlocks, 40¢
Hotchkiss, 30¢
Star, 45¢
Horseshoe, 40¢40¢10¢
Barnes Mfg. Co., 40¢40¢10¢
Nock's, 30¢
Brown's Pat., 25¢
Scandinavian, 90¢40¢10¢
Fram's Pat. Scandinavian low list, 60¢
Ames Sword Co. up to No. 150, 40¢
Ames Sword Co. above No. 150, 50¢

Lumber Tools.

Ring Peavies, "Blue Line", 50¢ doz \$20.00
Ring Peavies, Common, 50¢ doz \$18.00
Steel Socket Peavies, 50¢ doz \$21.00
Mall. Iron Socket Peavies, 50¢ doz \$19.00
Cant Hooks, "Blue Line", 50¢ doz \$16.00
Cant Hooks, Common Finish, 50¢ doz \$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish, 50¢ doz \$15.00
Cant Hooks, Mall. Socket Clasp, Common Finish, 50¢ doz \$14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish, 50¢ doz \$14.00
Cant Hooks, Clip Clasp, Common Finish, 50¢ doz \$12.00
Hand Spikes, 50¢ doz 6 ft., \$15.00; 8 ft., \$20.00

Pike Poles, Pike & Hook, 50¢ doz, 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50.
Pike Poles, Pike only, 50¢ doz, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00.
Pike Poles, not ironed, 50¢ doz, 12 ft., \$6.00; 14 ft., \$7.00; 16 ft., \$9.00; 18 ft., \$12.00; 20 ft., \$16.00.
Setting Poles, 50¢ doz, 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00.
Swamp Hooks, 50¢ doz \$18.00

Lustre—

Four-ounce Bottles, 50¢ doz, \$1.75; 75¢ gross, \$17.00

Mallets—

Hickory, 20¢10¢20¢10¢10¢
Lignumvite, 20¢10¢20¢10¢10¢
B. & L. Block Co., Hickory & L. V., 30¢30¢10¢

Match Safes—

Dangerfield's Self-Igniting, 50¢ doz \$1.50

Mattocks, Regular list, 60¢5¢60¢10¢

Meat Cutters—

Dixon's 50¢ doz, 40¢5¢
Nos., \$14.00 \$17.00 \$19.00 \$30.00
Woodruff's 50¢ doz, 40¢5¢
Nos., \$15.00 \$18.00
Champion 50¢ doz, 40¢45¢
Nos., 200 300 400
Hales Pattern 50¢ doz, 70¢70¢5¢
Nos., 11 12 13
American, 82¢00 \$39.00 \$45.00
Nos., 1 2 3 4 5
Each, \$5 \$7 \$10 \$25 \$50 \$60
Enterprise, 30¢
Nos., 10 12 22 32 42
Each, \$3 \$2.50 \$4 \$6 \$15
Pennsylvania, 40¢10¢
Nos., 3 4
50¢ doz, \$24.00 \$28.00 \$36.00 \$28.00
Miles' Challenge 50¢ doz, 45¢45¢10¢
Nos., \$22.00 \$30.00 \$40.00

Home No. 1, 50¢ doz, \$26.00, 55¢10¢

Draw Cut, each, 30¢
No. 5, 3 6 8
\$50 \$75 \$90 \$225 20¢25¢
Beef Shavers (Enterprise), 30¢10¢30¢
Chadborn's Smoked Beef Cutter, 50¢ doz \$66.00

Mining Knives—

Am. (2d quality), 50¢ gr., 1 blade, \$7; 2 blades, \$12; 3 blades, \$18, net
Lothrop's, 20¢10¢
Smith's, 50¢ doz, Single, \$2.00; Double, \$3, 40¢45¢
Knapp & Cowles, 50¢10¢60¢
Buffalo Adjustable, 50¢ doz \$3.00, 2¢

Molasses Gates—

Stebbin's Pat.	70¢@70¢7½
Stebbin's Genuine	60¢@10¢10
Stebbin's Tinned Ends	40¢@10
Chase's Hard Metal	50¢@10
Bush's	20¢
Lincoln's Pattern	70¢@70¢10
Weed's	20¢@10

Boss, # doz:

Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	60¢@10¢10
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Money Drawers... # doz, \$18¢@20

Muzzles—

Safety... # doz, \$3.00, 25¢

Nails, see Trade Report.

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny... # doz, \$2.50¢@2.60

Nail Puller—

Curtiss Hammer... # doz, \$9.00

Giant, No. 1... # doz, \$9.00, 10¢

Pelican... # doz, \$9.00, 25¢

Boss... # doz, \$9.00, 30¢

Lightning... # doz, \$9.00, 21¢

Nail Sets—

Square... # gr, \$4.00¢@4.25

Round... # gr, \$3.25

Cannon's Diamond Ppnt... # gr, \$12, 20¢

Nut Crackers—

Table (H. & B. Mfg. Co.)... # doz, \$2.00, 10¢

Turner & Seymour Mfg. Co... # doz, \$2.00, 10¢

Nuts—

Nuts, off list Jan. 1, 1888: Square, Hex.

Hot Pressed... 5.4¢ 5.4¢

Cold Punched... 5.4¢ 5.4¢

In lots less than 100 lb, add 1/2¢; 1-b

boxes, add 1¢ to list.

Oakum—

Government... # lb 7½¢ @ 8¢

U. S. Navy... # lb 6½¢ @ 7¢

Navy... # lb 5½¢ @ 6½¢

Oilers—

Zinc and Tin... 65¢@65¢10

Brass and Copper... 50¢@10¢50

Malleable, Hammers, Improved, No. 1.

\$3.60; No. 2, \$4.00; No. 3, \$4.40 # doz.

Malleable, Hammers, Old Pattern, same

list 10¢@10¢10

Prior's Pat. or "Paragon" Zinc... 40¢

Prior's Pat. or "Paragon" Brass... 50¢

Olmstead's Tin and Zinc... 60¢

Olmstead's Brass and Copper... 50¢

Broughton's Zinc... 60¢

Broughton's Brass... 60¢

Packing, Steam—

Rubber—

Standard... 60¢@10¢80¢10

Extra... 60¢@10¢80¢10

N. Y. B. & P. Co., Standard... 60¢@10¢80¢10

N. Y. B. & P. Co., Empire... 70¢

N. Y. B. & P. Co., Salamander... 70¢

Jenkins' Standard... # lb 65¢, 30¢

Miscellaneous—

American Packing... 10¢@11¢

Russia Packing... 14¢

Italian Packing... 13¢@14¢

Cotton Packing... 15¢@17¢

Jute... 7¢@8¢

Padlocks—

See Locks.

Pails—

Galvanized Iron—

Quarts... 10 12 14

Hill's Light Weight, # doz, \$2.75 3.00 3.25

Hill's Heavy Weight, # dz, 3.00 3.25 3.75

Whiting's... 2.75 3.00 3.25

Sidney Shephard & Co... 2.80 3.00 3.40

Iron Clad... 2.75 3.00 3.25

Fire Buckets... 2.75 3.25 3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—

Star Pails, 12 qt... # doz \$4.50

Fire, Stable and Milk, 14 qt... # doz \$5.85

Pencils—

Faber's Carpenters'... high list 50¢

Faber's Round Gilt... # gro \$5.25

Dixon's Lead... # gro \$4.50

Dixon's Lumber... # gro \$6.75

Dixon's Carpenters'... 40¢@10

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00;

6 to 7, \$13.00... 60¢

Picture Nails—

Brass Head, Sargent's list... 50¢@10¢10

Brass Head, Combination list... 50¢@10

Porcelain Head, Sargent's list... 50¢@10

Porcelain Head, Combination list... 40¢@10

Pinking Irons—

doz 65¢ net

Pipe, Wrought Iron—

List March 23, 1887.

1½ and under, Plain... 62½¢

1½ and over, Galvanized... 45¢

1½ and over, Plain... 65¢

1½ and over, Galvanized... 62½¢

Boiler Tubes, Iron.

1½ and under... 67½¢

2 in. to 2½ in... 62½¢

3 in. and larger... 65¢

Planes and Plane Irons—

Wood Planes—

Molding... 50¢@50¢10

Bench, First Quality... 60¢@60¢5

Bench, Second Quality... 60¢@10¢60

Bailey's (Stanley R. & L. Co.)... 40¢@10

Iron Planes—

Bailey's (Stanley R. & L. Co.)... 40¢@10

Miscellaneous Planes (Stanley R. & L. Co.)... 20¢@10

Victor Planes (Stanley R. & L. Co.)... 20¢@10

Steer's Iron Planes... 35¢@35¢5

Meriden Mal Iron Co... 30¢@10¢30

Davis's Iron Planes... 30¢@10¢30

Birmingham Plane Co... 50¢@50¢5

Gage Tool Co's Self-Setting... 20¢@10

Chaplin's Iron Planes... 40¢@40¢5

Sargent's... 30¢@10¢30

Plane Irons—

Plane Irons	20¢@10
Plane Irons, Butcher's	\$5.00¢@5.25 to 2
Plane Irons, Buck Bros	30¢
Plane Irons, Auburn Tool Co., "This"	40¢
Sandusky Tool Co.	40¢
Single and Cut	30¢
Double	40¢
L. & J. White	25¢

Pliers and Nippers—

Button's Patent... 30¢@10¢40

Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.

\$21.00 # doz... 20¢@10¢30

Humason & Beckley Mfg. Co... 50¢@50¢10

Gas Pliers, Custer's Nickel Plated... 60¢@5

Eureka Pliers and Nippers... 40¢

Russell's Parallel... 25¢

P. S. & W. Cast Steel... 50¢

P. S. & W. Tinnors' Cutting Nippers, add 8¢ dis 10¢

Carew's Pat. Wire Cutters... 30¢

Morrell's Parallel, # doz, \$12.00... 30¢@5

Cronk's 8 in., \$15.00; 10 in., \$21.00... 40¢@40¢5

Plumbs and Levels—

Regular List... 70¢@10¢70¢10

Disston's... 45¢@10

Pocket Levels... 70¢@10¢70¢10

Davis' Inclometers... 10¢@10

Polish, Metal.

Prestoline... 20¢@10

Krestoline Paste... 35¢@5

Gaston's Silver Compound... 35¢@5

Pokes, Animal—

Bishop's I. X. L... # doz \$6.50

Bishop's O. K... # doz \$5.50

Bishop's Pioneer... # doz \$3.75

Bishop's American... # doz \$3.00

Poppers, Corn—

Round or Square, 1 qt... # gr \$12.00¢@15.00

Round or Square, 2 qt... # gr \$25.00¢@26.00

Post Hole and Tree Augers

and Diggers—

Samson Post Hole Digger, # doz \$36.00... 25¢@10

Fletcher Post Hole Augers, # doz \$36, 20¢

Eureka Diggers... # doz \$16.00¢@17.00

Leed's... # doz \$8.00¢@9.00

Vaughan's Post Hole Auger... \$13.00¢@14.00

Kohler's Little Giant... # doz \$18.00

Kohler's Hercules... # doz \$15.00

Kohler's New Champion... # doz \$9.00

Schneider... # doz \$18.00

Ryan's Post Hole Diggers... # doz \$24.00

Cronk's Post Bars, # doz \$60.00... 50¢@50¢10

Gibbs Post Hole Digger, # doz \$30.00, 50¢

Imperial, # doz, \$15... 45¢

Potato Parers—

White Mountain... # doz \$5.00¢@5.50

Antrim Combination... # doz \$8.00

Hoosier... # doz \$13.50

Pruning Hooks and Shears—

Disston's Combined Pruning Hook and

Saw... # doz \$18.00, 20¢@10

Disston's Pruning Hook, # doz \$12.00... 20¢@10

E. S. Lee & Co.'s Pruning Tools... 40¢

Pruning Shears, Henry's Pat, # doz

\$3.75¢@4.00 net

Henry's Pruning Shears, # doz \$4.25¢

Wheeler, M. & C. Co.'s Combination, # doz \$12.00, 20¢

Dunlap's Saw and Chisel, # doz \$8.50, 30¢

J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25

Pulleys—

Hot House, Awning, &c... 60¢@10

Japanned Screw... 60¢@10

Brass Screw... 60¢@10

Japanned Slide... 60¢@10

Japanned Clothes Line... 60¢@10

Empire Sash Pulley... 55¢@60

Moore's Sash, Anti-Friction... 50¢

Hay Fork, Solid Eye, \$4.00; Swivel,

\$4.50... 50¢@10¢50

Hay Fork, "Anti-Friction," 5 in. Solid,

\$5.70... 50¢

Hay Fork, "F" Common and Pat.

Bushed... 20¢

Hay Fork, Tarbox Pat. Iron... 20¢

Hay Fork, Reed's Self-Lubricating... 60¢

Shade Rack... 45¢

Tackle Blocks... See Blocks

Moore's Anti-Friction 5 in. Wheel, # doz

\$12.00... 40¢

Pumps—

Clstern, Best Makers... 50¢@10¢60

Pitcher Spout, Best Makers... 60¢@10¢60

Pitcher Spout, Cheaper Goods... 70¢@5

Punches—

Saddlers' or Drive, good, # doz... 60¢@5

Bemis & Call Co.'s Cast Steel Drive... 50¢@5

Bemis & Call Co.'s Springfield Socket... 50¢@5

Spring, good quality... # doz \$2.50¢@2.60

Spring, Leach's Pat... 15¢

Bemis & Call Co.'s Spring and Check... 40¢

Solid Tinnors'... # doz \$1.44, 55¢

Tinnors' Hollow Punches... 20¢@2

Rice Hand Punches... 15¢

Avery's Revolving... 40¢

Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door, Wrt Brass, # lb 35¢... 15¢

Sliding Door, Ironized Wrt Iron... # ft 7¢

Sliding Door, Iron, Painted, # foot 4¢, 40¢

Barn Door, Light, In... 3 1/2 3 1/2

Per 100 feet... \$2.00 2.50 3.10, 10¢

B. D. for N. E. Hanger... Small, Med. Large.

Per 100 feet... \$2.15 2.70 3.25, net

Terry's Wrought Iron, # foot... 43¢@5

Victor Track Rail, 7¢ # foot... 50¢@5

Carrier Steel Rail, # foot... 45¢

Moore's Wrought Iron... 25¢

Rakes—

Cast Steel, Association goods... 65¢

Cast Steel, outside goods... 60¢@10¢70

Malleable... 70¢@70¢5

Gibbs Lawn Rake... \$12.00, 50¢@15

Anton Lawn Rake... \$6.00, 50¢@10

Ft. Madison Prize Bow Brace and Feet

less... 65¢

Fort Madison Steel Tooth Lawn Rake,

\$6.00... 25¢

Razors—

J. R. Torrey Razor Co... 20¢

Wostenholme and Butcher, \$10.00 to 2

Razor Straps—

Genuine Emerson... 60¢@60¢5

Imitation... # doz \$2.00, 20¢@10¢5

Torrey's... 20¢

Badger's Belt and Com... # doz \$2.00

Lamont Combination... # doz \$4.00

Rivets and Burrs—

Iron, list Nov. 17, '87... 60¢

Copper... 50¢@10¢60

Rivet Sets.

50¢@10

Rods—

Stair, Brass... 25¢@2

Stair, Black Walnut... # doz 40¢

Rollers—

Barn Door, Sargent's list... 60¢@10¢10

Acme Moore's Anti-Friction... 55¢

Machine—
Flat Head, Iron.....55¢
Round Head, Iron.....50¢

Bench and Hand—
Bench, Iron.....55¢10¢55¢10¢10¢
Bench, Wood, Beech.....20¢10¢
Bench, Wood, Hickory.....20¢10¢
Hand, Wood.....25¢10¢25¢10¢5¢
Lag, Blunt Point.....75¢75¢10¢
Coach and Lag, Gimlet Point.....75¢
Bed.....25¢5¢
Hand Rail, Sargent's.....60¢10¢
Hand Rail, H. & B. Mfg. Co.....70¢10¢75¢
Hand Rail, Am. Screw Co.....75¢
Jack Screws, Millers Falls list.....50¢50¢5¢
Jack Screws, P. S. & W.....35¢
Jack Screws, Sargent.....60¢10¢60¢10¢5¢
Jack Screws, Stearns.....40¢40¢10¢

Scroll Saws—
Lester, complete, \$10.00.....25¢
Rogers, complete, \$4.00.....25¢
Barnes' Builders' and Cabinet Makers'.....15¢
Barnes' Scroll Saw Blades.....35¢

Scythe Snaths..... 50¢25¢

Shears—
American (Cast) Iron.....75¢10¢75¢10¢5¢
Pruning.....See Pruning Hooks and Shears.
Barnes' Lamp Trimmers.....\$ doz \$3.75
Tinners.....20¢25¢
Seymour's, List, Dec. 1881.....

Heinrich's, List, Dec. 1881.....60¢10¢10¢60¢10¢10¢5¢
Heinrich's Tailor's Shears.....33¢4¢
First quality C. S. Trimmers.....80¢80¢10¢
Second quality C. S. Trimmers.....80¢10¢80¢10¢10¢
Acme Cast Shears.....10¢10¢
Diamond Cast Shears.....10¢
Clipper.....10¢10¢
Victor Cast Shears.....75¢10¢75¢10¢5¢
Howe Bros. & Hulbert, Solid Forged Steel.....40¢
Chicago Forge & F. Co., Solid Steel Forged.....60¢
Clausen Shear Co., Japanned.....70¢
Clausen Shear Co., Nickeled, same list. 00¢

Sheaves—
Sliding Door—
M. W. Co., list July, 1888.....50¢10¢60¢5¢
R. & E., list Dec. 18, 1885.....55¢20¢
Corbin's list.....60¢10¢25¢
Patent Roller.....60¢10¢25¢
Patent Roller, Hatfield's.....75¢
Russell's Anti-Friction, list Dec. 18, 1885.....60¢5¢
Moore's Anti-Friction.....50¢

Sliding Shutter—
R. & E., list Dec. 18, 1885.....60¢10¢25¢
Sargent's list.....60¢10¢
Reading list.....60¢10¢10¢

Ship Tools—
L. & I. J. White.....20¢5¢
Albertson Mfg. Co.....25¢

Oes, Horse, Mule, &c.—

Horse—
Burden's, Perkins', Phoenix, at factory.....\$4.00

Mule—
Add \$1 per keg to above prices.

Ox, Wrought—

Ton lots.....\$ 9¢
1000 lb lots.....\$ 9¢
500 lb lots.....\$ 10¢

Shot—
(Eastern prices 2¢ off, cash, 5 days.)

Drop, 25 bag, 25 lb.....\$1.16
Drop, 25 bag, 5 lb......29
Buck and Chilled, 25 lb bag.....1.41
Buck and Chilled, 5 lb bag......34

Shovels and Spades—

Amer's Shovels, Spades, &c., list Nov. 1, 1885.....20¢
NOTE.—Jobbers frequently give 50¢75¢ extra on above.

Griffith's Black Iron.....50¢10¢
Griffith's C. S. Iron.....60¢10¢10¢
Griffith's Solid C. S. R. R. Goods.....20¢
Old Colony (Sanford Fork & Tool Co.) 20¢
St. Louis Shovel Co.....20¢20¢75¢
Hussey, Binns & Co.....15¢25¢
Hubbard & Co.....20¢20¢75¢
Lehigh Mfg. Co.....50¢10¢
Payne Pettibone & Son, list January, 1886.....30¢
Remington's (Lowman's) Pat. 30¢10¢40¢
Rowland's, Black Iron.....50¢10¢
Rowland's Steel.....60¢5¢60¢10¢

Shovels and Tongues—

Iron Head.....60¢10¢60¢10¢5¢
Brass Head.....60¢10¢10¢

Skins, Thimble—

Western list.....75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887 20¢
Coldbrookdale Iron Co.....50¢10¢
Utica P. S. Skins.....60¢
Utica Turned and Fitted.....35¢

Sieves—

Buffalo Metallic, S. S. & Co.....50¢25¢10¢
Shaker (Barler's Pat.) Flour Sifters.....

Electric.....\$ doz \$2.00
Hunter's.....\$ gr \$18.00
Smith's Adjustable Sifters.....\$ doz \$2.00
Smith's Adjustable Milk Strainer.....\$ doz \$1.25

Sieves, Wooden Rim—

Mesh 18, Nested, \$ doz.....Iron. Plated. 70¢ 90¢
Mesh 20, Nested, \$ doz.....85¢ \$1.00
Mesh 24, Nested, \$ doz.....\$1.00 1.10

Slates—

School, by case.....40¢

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....55¢
Fitch's (Bristol).....50¢10¢
Hotchkiss.....10¢
Andrews.....50¢
Sargent's Patent Guard.....70¢10¢
German, new list.....40¢10¢
Covert.....50¢25¢
Covert, New Patent.....50¢5¢25¢
Covert, New R. E.....60¢25¢
Covered Spring.....60¢10¢10¢

Soldering Irons—
Covert's Adjustable, list Jan. 1, 1886.....35¢25¢

Spoke Shaves—
Iron.....45¢
Wood.....30¢
Bailey's (Stanley R. & L. Co.).....40¢10¢
Stearns.....20¢10¢30¢

Spoke Trimmers—

Bonney's.....\$ doz \$10.00, 50¢
Stearns.....20¢10¢
Ives', No. 1, \$15.00; No. 2, \$12.00 \$ doz.....55¢10¢
Douglas.....\$ doz \$0.00, 20¢

Spoons and Forks—

Tinned Iron—
Basting, Cen. Stamp. Co.'s list.....70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....70¢10¢
Buffalo S. S. & Co.....30¢10¢25¢
Silver Plated—(4 mos. or 5¢ cash 30 days.)

Meriden Brit. Co., Rogers.....50¢
C. Rogers & Bros.....50¢
Rogers & Bro.....50¢
Reed & Barton.....50¢
Wm. Rogers Mfg. Co.....50¢10¢90¢
Simpson, Hall, Miller & Co.....50¢10¢
Holmes & Edwards Silver Co. 50¢10¢60¢
L. Boardman & Son.....50¢10¢

Miscellaneous.

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50¢10¢
No. 30 Silver Metal.....50¢10¢
No. 24 German Silver.....50¢10¢
No. 50 Nickel Silver.....50¢10¢
No. 49 Nickel Silver.....50¢10¢
German Silver, Hall & Eiton.....50¢5¢ cash
Nickel Silver.....50¢5¢50¢10¢5¢ cash
Britannia.....90¢

Boardman's Nickel Silver.....50¢
Boardman's Britannia Spoons, case lots.....00¢

Springs—

Elliptic, Concord, Platform and Half Scroll.....60¢60¢5¢
Cliff's Bolster Springs.....25¢

Squares—

Steel and Iron.....75¢10¢80¢
Try Square and T Bevels.....60¢10¢60¢10¢
Disston's Try Square and T Bevels.....45¢10¢
Winterbottom's Try and Miter.....30¢10¢
Starrett's Micrometer Caliper Squares.....25¢

Avery's Flush Bevel Squares..... 40¢
Avery's Bevel Protractor..... 50¢

Staples—

Fence Staples, Galvanized, / Same price
Fence Staples, Plain.....as 17¢b Wire.
See Tri-Rep.

Steelyards..... 40¢10¢50¢

Stocks and Dies—

Blacksmith's
Waterford Goods.....30¢5¢30¢10¢
Butterfield's Goods.....30¢5¢30¢10¢
Lighting Screw Plate.....25¢30¢
Reece's New Screw Plates.....33¢5¢40¢

Stone—

Hindustan No. 1, 3¢; Axe, 3¢; Slips
No. 1, 4¢
Sand Stone.....\$ 2¢4¢
Washita Stone, Extra.....\$ 10¢20¢
Washita Stone, No. 1.....\$ 14¢15¢
Washita Stone, No. 2.....\$ 10¢11¢
Washita Slips, No. 1, Extra.....\$ 36¢38¢
Washita Slips, No. 1.....\$ 24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....\$ 1.50
Arkansas Stone, No. 1, 6 to 9 in.....\$ 1.85
Turkey Oil Stone, 4 to 8 in.....\$ 4.00
Turkey Slips.....\$ 1.00, 1.50
Lake Superior, Chase.....\$ 1¢16¢
Lake Superior Slips, Chase.....\$ 31¢32¢
Seneca Stone, Red Paper Brand.....18¢20¢
Seneca Stone, High Rounds.....\$ 20¢25¢
Seneca Stone, Small Whets.....\$ gr \$24.00

Stove Polish—

Joseph Dixon's.....\$ gr \$6.00, \$10.00
Gem.....\$ gr \$4.50, 10¢
Gold Medal.....\$ gr \$6.00, 25¢
Mirror.....\$ pro \$6.00, —
Lustro.....\$ gr \$4.75
Ruby.....\$ gr \$3.75
Rising Sun, 5 gr 10 gr.....\$ gr \$6.50
Dixon's Plumbago.....\$ 40.00
Boynton's Noon Day.....\$ gr 13.00
Parlor Pride Stove Enamel.....\$ gr 3 cans
Yates' Liquid.....\$ 3 5 10 gal.....8¢
Yates Standard Paste Polish, 10-b cans.....\$ gal \$0.90, 80 70 60
Jet Black.....\$ gr \$3.50
Japanese.....\$ gr \$3.50
Firestone.....\$ gr \$2.50
Diamond O. K. Enamel.....\$ gr \$19.00
Bonnell's Polish.....\$ gr \$2.00
Bonnell's Paste Stove Polish.....\$ gr \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....12¢4¢
Black Jack Water Paste, 5 and 10 lb cans.....12¢4¢
Nickel Plate Paste.....\$ gr \$6.00

Tacks, Brads, &c.—

List, Jan. 2, 1888.—[Note.—Some manufacturers are selling Tacks at slightly higher prices than those named:]
American Iron Carpet.....80¢80¢5¢
Steel Carpet.....80¢80¢5¢
Swedes Iron Carpet.....80¢80¢5¢
American Iron Cut.....75¢75¢10¢
Swedes Iron.....75¢5¢75¢10¢
Swedes Iron, Upholsterers'.....75¢10¢75¢10¢5¢

Tinned Swedes Iron..... 75¢10¢75¢10¢5¢
Tinned Swedes Iron, Upholsterers'..... 75¢10¢75¢10¢5¢

Gimp and Lace..... 75¢10¢75¢10¢5¢
Tinned Gimp and Lace..... 75¢10¢75¢10¢5¢
Swedes Iron Trimmers..... 75¢10¢75¢10¢5¢
Swedes Iron Miners'..... 75¢10¢75¢10¢5¢
Swedes Iron Bill Posters or Railroad..... 75¢10¢75¢10¢5¢

Swedes Steel (Swedes Iron price list),..... 80¢80¢5¢

Copper Tacks..... 50¢10¢
Copper Finishing, Trunk and Clout Nails..... 50¢10¢
Finishing Nails..... 70¢10¢70¢10¢10¢
Trunk and Clout Nails..... 70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails..... 70¢10¢70¢10¢10¢
Basket Nails..... 70¢10¢70¢10¢10¢

Common and Patent Brads, 70¢10¢70¢10¢10¢

Hungarian Nails..... 70¢10¢70¢10¢10¢
Chair Nails..... 70¢10¢70¢10¢10¢
Zinc Glaziers' Points..... 50¢50¢5¢
Clear Box Nails..... 50¢10¢50¢10¢5¢
Picture Frame Points..... 50¢10¢50¢10¢5¢
Looking-Glass Tacks..... 50¢10¢50¢10¢5¢
Leathered Carpet..... 50¢10¢50¢10¢5¢
Brush Tacks..... 50¢10¢50¢10¢5¢
Shoe Finders', List Jan. 2, 1888, 10¢10¢

Lining and Saddle Nails, List Jan. 1, 1888:

Silvered.....30¢10¢10¢
Japanned.....20¢10¢10¢
Double-Pointed Tacks.....85¢
Wire Carpet Nails.....50¢10¢
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50¢10¢

Tap Borers—

Common and Rind.....30¢10¢
Ive's Tap Borers.....33¢45¢
Enterprise Mfg. Co.....20¢10¢30¢
Clark's.....33¢45¢

Tapes, Measuring—

American.....25¢10¢
Spring.....40¢
Chesterman's, Regular list.....25¢30¢

Thermometers—

Tin Case.....80¢80¢10¢

Thimble Skins—See Skins.

Ties, Bale—Steel

Standard Wire, list.....50¢10¢5¢

Tinners' Shears, &c.—

Shears and Snips (P. S. & W.).....20¢25¢
Punches, see Punches.
Snips, J. Mallinson & Co.....39¢4¢

Tinware—

Stamped, Japanned and Pieced, list Jan. 20 1887.....75¢75¢5¢

Tire Benders, Upsetters, &c—

Stoddard's Lightning Tire Upsetters.....15¢
Detroit Perfected Tire Bender.....15¢

Tobacco Cutters—

Champion.....20¢10¢30¢
Wood Bottom.....\$ doz \$5.00, \$5.25
All Iron.....\$ doz \$4.25
Nashua Lock Co.'s \$ doz, \$18.00 50¢55¢
Wilson's.....55¢
Sargent's.....\$ doz, \$24.55 10¢
Acme.....\$ doz, \$20.00, 40¢

Transom Lifters—

Wellensak's:
Class 3 and 4, Bronzed Iron.....50¢
Class 3 and 4, Bronze Metal.....25¢
Class 3 and 4, Brass.....35¢
Skylight Lifters.....35¢
Crown, Eagle and Shield.....50¢
Rehner's, list Jan. 1, 1887.....

Bronzed Iron Rods.....50¢10¢2¢
Brass, Real Bronze or Nickel Plate.....30¢
Excelsior.....50¢10¢25¢
Shaw's.....50¢10¢
Payson's Universal.....40¢40¢10¢

Traps—

Game—
Newhouse.....35¢40¢5¢
Oneida Pattern.....70¢70¢5¢
Game, Blake's Patent.....40¢10¢5¢

Mouse and Rat—

Mouse Wood Choker, \$ doz holes, 11¢12¢
Mouse, Round Wire.....\$ doz \$1.50, 10¢
Mouse, Cage Wire.....\$ doz \$2.50, 10¢
Mouse, Catch-em-alive.....\$ dz \$2.50, 15¢
Mouse, "Bonanza".....\$ gr \$10.00
Mouse Delusion.....\$ gr \$15.00
Kat, "Decoy".....\$ gr \$10.00, 10¢
Ideal.....\$ gr \$5.25
Cyclone.....\$ gr \$5.25
Kickless Metallic Mouse, 5-hole traps, \$ doz 90¢
In full cases.....\$ doz 75¢

Trowels—

Lothrop's Brick and Plastering.....25¢
Reed's Brick and Plastering.....15¢
Diaston's Br'k and Plastering, 25¢25¢10¢
Pease's Plastering.....25¢
Clement & Maynard's.....15¢20¢
Rose's Brick.....25¢
Brade's Brick.....25¢
Worral's Brick and Plastering.....20¢
Garden.....70¢

Triers—

Butter and cheese.....25¢

Trucks, Warehouse, &c.—

B. & L. Block Co's list, '82.....40¢

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine.....BC. B.
No. 9, 14 and 16 lb Balls.....22¢ 30¢
No. 12, 14 and 16 lb Balls.....21¢ 29¢
No. 18, 14 and 16 lb Balls.....18¢ 28¢
No. 24, 14 and 16 lb Balls.....18¢ 28¢
No. 30, 14 and 16 lb Balls.....27¢
No. 204, Mattrass, 14 and 16 lb Balls.....45¢50¢
Chalk Line, Cotton, 1/2 lb Balls.....25¢
Mason Line, Linen, 1/2 lb Balls.....55¢
2-Ply Hemp, 1/2 and 1/4 lb Balls (Spring Twine).....11¢1¢
3-Ply Hemp, 1/2 lb Balls.....11¢11¢
Cotton Wrapping, 5 Balls to lb.....15¢16¢
2, 3, 4 and 5-Ply Jute, 1/2 lb Balls.....10¢
Wool.....6¢6¢4¢
Paper.....13¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....18¢

Vises—

Solid Box.....80¢80¢5¢
Parallel—
Fisher & Norris Double Screw.....15¢10¢
Stephens.....25¢30¢

Parker's..... 30¢25¢
Wilson's..... 55¢
Howard's..... 40¢
Bonney's..... 40¢10¢
Millers Falls..... 40¢40¢10¢
Trenton..... 40¢5¢40¢10¢
Merrill's..... 15¢20¢
Sargent's..... 60¢10¢10¢
Backus and Union..... 40¢
Double Screw Leg..... 15¢10¢
Prentiss..... 20¢5¢25¢
Simpson's Adjustable..... 40¢
Moore's..... 20¢

Saw Fliers—
Bonney's, Nos. 2 & 3, \$15.00.....40¢10¢
Stearns.....33¢45¢10¢10¢
Stearns' Silent Saw Vises.....33¢45¢
Sargent's.....60¢10¢
Hopkins.....\$ doz \$17.50, 10¢
Reading.....40¢10¢
Wentworth Hand Vises.....\$ gr \$42.00
Cowell Hand Vises.....20¢
Bauer's Pipe Vises.....10¢

Wagon Boxes—

Per B.....21¢4¢

Wagon Jacks—

Dalay.....25¢

Washer Cutters—

Smith's Pat.....\$ doz \$12.00, 20¢10¢10¢
Johnson's.....\$ doz \$11.00, 32¢4¢
Penny's, 9 doz Pol. \$14; Jap'd, \$16.00, 55¢
Appleton's.....\$ doz \$16.00, 60¢10¢
Bonney's.....30¢10¢

Washers—

Size.....1/2 5-16 3/8 1/2 5/8 3/4 1
Washers.....7 5 4 4 3 3 3 3 3 3
In lots less than 200 lb, \$ lb, add 1/4¢, 5-lb boxes 1¢ to list.

Wedges—

Iron.....\$ lb 3¢4¢
Steel.....\$ lb 4¢

Well Buckets, Galvanized—

Hill's.....\$ doz, 12 qt, \$4.25; 14 qt, \$5.25
Iron Clad.....\$ doz, 14 qt, \$4.25, \$4.50
Whiting's Flat Iron Band.....\$4.25, \$4.50
Whiting's Wired Top.....\$ doz \$4.00, \$4.25

Well Wheels—

8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25

Wire—

Iron—
Market,
Br. & Ann., Nos. 0 to 18.....70¢10¢75¢
Cop'd, Nos. 0 to 18.....70¢70¢5¢
Galv., Nos. 0 to 18.....55¢5¢
Tin'd, Tinned list Nos. 0 to 18.....07¢5¢

Br. and Ann'd, Nos. 16 to 18, 75¢4¢
Bright and Ann'd, Nos. 19 to 26, 75¢5¢
Br. and Ann'd, Nos. 27 to 38, 75¢10¢5¢
Tinned.....70¢70¢10¢
Tinned Broom Wire.....70¢5¢70¢10¢
Galvanized Fence.....65¢
Annealed Fence, Nos. 8 and 9.....75¢
Annealed Grape, Nos. 10 to 14.....75¢
Brass, list Jan. 18, 1884.....15¢20¢
Copper, list Jan. 18, 1884.....30¢35¢
Barb Fence.....See Trade Report
Wire on Spools.....65¢
Mallin's Steel and Tin'd Wire on Spools.....40¢
Mallin's Brass and Cop. Wire on Spools 30¢
Cast Steel Wire.....\$ doz \$6.00 to \$ 30¢
Stub's Steel Wire, Nos. 12 to 30, 55¢ lb
Picture Wire.....New list, 50¢
Barb Wire Safety Guards.....\$ 1000, \$0.00, 25¢
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.—

Painted Screen Cloth, good quality.....\$ 100 sq. ft., \$1.80 to \$1.90
Galvanized Wire Netting.....75¢75¢5¢

Wire Goods—

See Bright Wire Goods.

Wire Rope—

List May 1, 1886.
Iron.....30¢
Cast Steel.....40¢

Wrenches—

American Adjustable.....40¢
Baxter's Adjustable "S".....40¢10¢50¢
Baxter's Diagonal.....40¢10¢50¢
Coe's Genuine.....55¢3¢
Coe's "Mechanics".....55¢10¢3¢
Girard Standard.....70¢10¢
Machinists', Sterling Wrench Co. 70¢10¢
Lamson & Sessions' Engineers'.....60¢10¢
Lamson & Sessions' Standard.....70¢10¢
Gies' Pattern, Wrought.....
Girard Agricultural.....
Lamson & Sessions' Agric'l.....80¢

